

Aluminum to
transf∞rm



2023 Climate Agenda Report

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Introduction



Maurício Mendonça Mendes Bispo, Maintenance Engineer, Alumínio Plant (SP), and his children

Welcome

Welcome to CBA's 2023 Climate Agenda Report, prepared as part of the Company's ongoing commitment to sustainability and climate stewardship. Developed in accordance with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD), this report provides a comprehensive and transparent account of how CBA manages and addresses climate change-related challenges and opportunities in its operations.

This report is for the period from January 1 to December 31, 2023, and is organized into three major sections:

- **Aluminum to Transform:** this section presents CBA, its products, operations and highlights from the year, providing an overview of the Company and its most significant recent achievements
- **Tackling Climate Change:** this section addresses climate governance, strategy and risk management, and explores opportunities arising amid the challenges

- **Low Carbon Aluminum:** this section presents the Company's metrics and targets as well as production process solutions for reducing emissions

CBA's Climate Agenda Report has followed reporting requirements from the International Reporting Standards developed by the International Sustainability Standards Board (ISSB). The Company is preparing to achieve full compliance with IFRS S1 and S2 pursuant to Brazilian Securities Commission (CVM) Resolution 193/2023. CBA seeks to align its reporting practices with internationally recognized best-practice standards.

For further information about CBA's sustainability practices, see the Company's [2023 Annual Report](#).



Alumínio plant (SP)

Developed in accordance with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD), **this report provides a comprehensive and transparent** account of how CBA manages climate change.



Luciano Alves
CEO

Message from Company Leadership

Letter from the CEO

The year in review was a challenging one, in particular for the global aluminum industry. Geopolitical tensions, a real estate crisis in China, rising global interest rates and inflation, and other external factors heightened uncertainties for the global economy. Consequently, aluminum prices on the London Metal Exchange (LME) remained under pressure and volatile, failing to provide adequate profitability for the global aluminum industry.

But amid the aluminum downturn, there were also positive developments in the domestic market: Brazil raised its taxes on aluminum imports, a tax reform was passed in Congress, and discussions progressed regarding the regulated carbon market—three developments that could lead to a fairer and more competitive market.

At CBA, we weathered the adverse market conditions with a focus on our long-term strategy—which remains unchanged at its core. Our commitment to providing low-carbon aluminum and sustainable solutions to the market guided us through yet another cycle, supported by a set of robust ESG targets we have committed to achieve by 2030, including the following:

- Reduce average emissions for cast products, cradle-to-gate, by 40% from a 2019 baseline
- Increase the ratio of aluminum recycled from industrial and end-of-life scrap at Metalex—one of our recycling plants—to 80%
- Increase the ratio of aluminum recycled from industrial and end-of-life scrap at the Alumínio plant (SP) to 50%

- Establish a climate change action plan
- Create a roadmap to becoming carbon neutral by 2050

As part of this journey, in 2023 we delivered important planned investments, including a new scrap treatment line at Metalex with a capacity to process up to 100,000 metric tons of scrap per year, and CBA's first Recycling & Processing Center. These initiatives will support



400

t/month

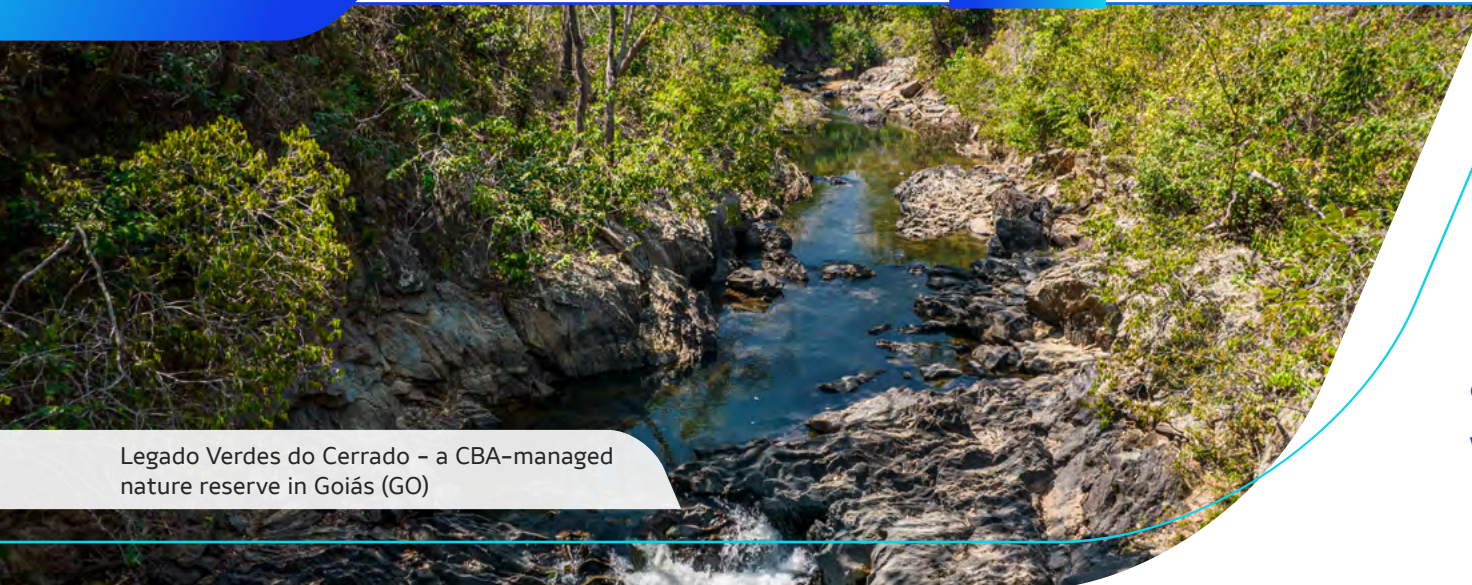
average processing
capacity at CBA's first
Recycling & Processing
Center.

continued growth in recycling and create an opportunity to expand the ratio of recycled content in the aluminum we produce. A higher ratio of scrap content has a significant impact in decarbonizing CBA's aluminum, reducing energy consumption in the process by up to 95%. It also has a positive social impact by boosting the recycling market, supporting cooperatives and associations, and generating employment. We also made progress on our dry residue disposal project and ReAl, a project to recycle flexible carton packaging.

In collaboration with Instituto Votorantim and Instituto Itaúsa, we unveiled our Climate Action Initiative at the United Nations Climate Change Conference of the Parties (COP28). This initiative aims to bolster municipal governments' resilience by measuring the vulnerability of Brazilian cities to climate change and providing a checklist to address related risks, particularly among vulnerable populations. The resulting inputs will inform a pilot Public Management Support program in regions where CBA operates, aimed at building climate resilience in local communities, reducing risks, and advancing adaptation actions.

Our decarbonization and sustainability efforts continue to garner recognition. In 2023, we were included in CDP's "A List" for the second consecutive year, positioning us as leaders in climate action. Within the Science Based Targets initiative (SBTi), CBA is leading the industry as the first primary aluminum producer to have set science-based emission reduction targets. As a signatory of the UN Global Compact in Brazil, we remain committed to supporting the Sustainable Development Goals and principles related to the environment, human rights, labor, and anti-corruption.

Within the Global Compact, we have committed to the Net Zero Ambition and, in 2023, we participated in the SDGs in Brazil event in New York, showcasing our climate mitigation efforts. As a spokesperson for SDG 13 - Climate Action through the Leadership with Impact Program, I have had the opportunity to champion urgent decarbonization and climate justice among different stakeholders.



Legado Verdes do Cerrado – a CBA-managed nature reserve in Goiás (GO)

CBA is proudly **one of the few aluminum manufacturers in the world** to have joined the First Movers Coalition's (FMC) First Suppliers Hub.

CBA is also a member of the First Movers Coalition (FMC) launched by the World Economic Forum during COP21. We are proud to have been the first Brazilian company to join this initiative and one of the few aluminum companies globally to join its First Suppliers Hub, a platform of low-carbon suppliers.

Leveraging our capacity for reinvention, we have built a unique company with clear competitive advantages that also enable us to play a leading role in the energy transition, the low-carbon economy and other global trends for which aluminum is essential.

As we enter 2024, the global aluminum market presents more optimistic prospects. With limited global production and historically low stocks, the future outlook is likely to improve if there is a sustained recovery in global consumption.

We remain committed to reducing our carbon footprint and developing sustainable, efficient solutions. We also see opportunities to increase awareness and uptake of our Alennium label, encouraging the use of sustainable aluminum in the value chain and supporting sustainability goals in both our own and other industries.

Our focus remains on our purpose: transforming lives through aluminum. To embark on this journey with us, I invite you to learn more about our initiatives and efforts in our 2023 Climate Agenda Report.

Luciano Alves
CEO

Letter from the CFO

CBA approaches climate change strategically, embedding it in its business decisions, risk assessments, and its 2030 ESG Strategy. In 2023, CBA's long-term agenda demonstrated its resilience. Despite necessary adjustments to project timelines, we maintained focus and continued progress on key initiatives aligned with our most significant commitments and targets.

CBA follows best practices in risk management, under the oversight of the Chief Financial and Investor Relations Officer. We dedicate special attention to climate risks, employing stringent identification and mitigation processes. Using a conservative approach, we have successfully prepared the Company to face even the most challenging scenarios. Our risk assessments weigh probability against impact, ensuring risks are proactively and effectively managed.

CBA's climate governance efforts, encompassing risk management and project development, gained broad recognition in 2023. Our recent market ratings are a testament that we are on the right path. Throughout the year, each of our ratings and rankings saw improvement.

For the second year running, we secured a place on CDP's A List, which recognizes industry-leading transparency and climate governance. We were also reselected for B3's Corporate Sustainability Index (ISE B3), maintaining our standing within the top 10. The ISE, which includes 78 companies across 36 sectors, tracks publicly traded companies based on ESG criteria. In addition, we had an above-average performance in the S&P's Corporate Sustainability Assessment (CSA). In our debut year of active participation, we ranked 4th in our industry, achieving a score of 61/100—40% above the industry average.

These accolades reflect our unwavering commitment and have opened doors to green finance and loans on more favorable terms. Since 2020, we have secured over R\$ 3 billion in ESG-linked loans. In 2023, 43% of our funds were raised through Sustainability-Linked Loans, with debt service costs tied to meeting annual greenhouse gas (GHG) reduction targets.

Our dedication to sustainability continues to deepen, embedding responsible practices across all operations. We invite you to learn more about our management approach and progress in CBA's Climate Agenda Report.

Camila Abel Correia da Silva
CFO



Camila Abel, Chief Financial (CFO)
and Investor Relations Officer, CBA



Aluminum to transform

Employees at the Itapissuma rolling mill (PE)

About CBA

Founded in 1955, CBA is a publicly traded company, listed in an enhanced governance (*Novo Mercado*) segment of the Brazilian stock exchange, and a member of Brazilian conglomerate Votorantim S.A., its majority shareholder. CBA is the only vertically integrated aluminum producer in Brazil, and one of the few in the world, with operations that span from bauxite mining to the production of a wide range of primary and downstream products. With a presence in seven Brazilian states and a dedicated team of over 6,000 employees, CBA is committed to producing low-carbon aluminum, contributing to a more sustainable future.

Positioned favorably on the global aluminum industry cost curve, CBA owes this to its self-reliance in bauxite and alumina, its vertically integrated value chain, and its capacity for 100% renewable electricity generation. Furthermore, CBA has a significant presence in the scrap recycling and processing sector, and has increased its share of the secondary alloys market and actively reduced its carbon footprint.

With a focus on sustainability and innovation, CBA has continued to implement its 2030 ESG Strategy, a set of commitments and targets across the environmental, social, and governance dimensions. Guided by its purpose of delivering aluminum solutions that transform lives, CBA works continuously to advance sustainable production, uphold ethical and environmental standards, and build meaningful partnerships with employees, customers, suppliers, industry and financial associations, communities, and investors. This supports the Company's ambition to deliver increasingly customized and sustainable solutions that create positive impacts on the industry, the environment, and society.



100%

electric renewable
generation capacity



Sorocaba Complex –
Santa Helena MHPP (SP)



Billets produced at Metalex,
Araçariquama (SP)

Operations, products and applications

CBA's products and services are used in the automotive, building and construction, energy, agribusiness, consumer goods, packaging, transportation, and metallurgical industries.

OPERATIONS

Aluminum Business

- Mining operations: Poços de Caldas, Miraf, Itamarati de Minas (MG) and Barro Alto (GO)
- Alumínio plant (SP)
- Itapissuma (PE)
- Metalex (SP)
- Alux (SP)
- Sorocaba facility (SP)
- Distribution Center and Solutions & Services Center (RS)
- Solutions & Services Centers (SP)
- Corporate Office (SP)

Energy Business

- 16 wholly owned (SP and MG) and 6 jointly owned (SC and RS) hydroelectric power plants
- 2 Wind Complexes (PI and PE)

NATURE RESERVES

- Legado das Águas (SP)
- Legado Verdes do Cerrado (GO)

Primary products

- Bauxite
- Hydrate
- Alumina
- Molten aluminum
- Ingots
- Secondary ingots
- Slabs
- Billets
- Rod

Semi-fabricated products

- Caster rolls
- Sheet and coil
- Foil
- Extruded profiles
- Roofing and siding
- Parts and components
- Advanced parts and components

2023 highlights



CDP A Rating

For the second consecutive year, CBA was included on the A List of the CDP, a not-for-profit charity that runs the global environmental disclosure system, evaluating and recognizing the efforts of companies to mitigate the environmental impacts from their operations. CBA was recognized for its leadership in transparency and performance around climate change. In 2022, the Company became the first and only aluminum producer in the world to receive an "A" rating from the CDP.



CDP Supplier Engagement Leaderboard - SER

CBA was distinguished as an industry leader in supplier

engagement around climate change. This assessment evaluates the company's engagement with suppliers based on its responses to questions about Governance, Targets, Scope 3 GHG emissions, and Value Chain Engagement within CDP's Climate Change questionnaire.

S&P Corporate Sustainability Assessment (CSA)

The CSA is an annual evaluation of companies' sustainability practices. In 2023, the first year CBA underwent the assessment, the Company scored 61 points, 40% higher than the average for the global aluminum industry. In the Climate Strategy category, CBA was the top performer within the aluminum sector.

Conference of the Parties (COP)

CBA attended the Conference of the Parties (COP 28) in 2023. During the event, the Company's Climate Action Initiative was launched to bolster the climate resilience of Brazilian municipalities. Learn more on page 26.

Represented by its Chief Sustainability, Safety, and Environment Officer, CBA participated in two discussion panels. One panel, in collaboration with the Global Compact, discussed aluminum's crucial role in transitioning to a Net Zero economy. The second panel, in partnership with the Brazilian Aluminum Association (ABAL), highlighted the potential climate benefits from Brazil's low-carbon aluminum. During the event, CBA also formalized its support for an initiative launched by the International Aluminium Institute (IAI) to track greenhouse gas targets in the aluminum industry.

Climate Week

At the invitation of the UN Global Compact, CBA participated in the panel "Decarbonization journey of the business sector: pathways to a new Net Zero economy" during New York's Climate Week. This panel was organized by the Net Zero Ambition Movement, a CBA-supported initiative that assists companies in establishing science-based climate commitments.

CBA is the **world's first and only primary aluminum company** to achieve an 'A' rating in the CDP assessment.

First Movers Coalition

In 2022, CBA joined the First Movers Coalition, a global initiative focusing on decarbonizing sectors responsible for 30% of global emissions. This coalition was founded through a partnership between the World Economic Forum and the United States to stimulate future demand for low-carbon products. In 2023, CBA joined a pilot program for suppliers called the [First Suppliers Hub](#), connecting companies nearing low-carbon production in line with the movement's sector commitments.

GHG inventory

CBA published a new edition of its greenhouse gas inventory, using the GHG Protocol methodology. The inventory was awarded Gold reporting status by the Public Emissions Registry for its comprehensive and third-party-verified data. In 2023, progress was made towards implementing an automated inventory system.



LEARN MORE

Visit the official [Public Emissions Registry](#) page to access CBA's emission inventory data.

Power generation

CBA has the capacity to produce 100% renewable electricity through wholly or jointly-owned hydroelectric and wind power plants. In 2023, the company generated 7,824 GWh from renewable sources.

Aluminum recycling

In 2023, CBA launched a new scrap treatment line at Metalex. Its standout feature is its capability to separate various materials like iron, rubber, plastic, wood, and construction waste. This enhances the purity of the metal and has supported an increase in recycled content from 60% to 80% in aluminum production. The new process will also reduce the requirement for new raw materials, energy consumption and the company's overall carbon footprint.

CBA also started operation of its first Processing and Recycling Center at the Metalex plant in Araçariçuama (SP). Spanning 1,500 m², the facility has the capacity to process an average of 400 metric tons of material per month. Scrap is processed at the new facility and then delivered not only to the Metalex (SP) plant but also to Alumínio (SP), Itapissuma (PE), and Alux (SP).



Dameres Prado da Conceição, logistics analyst, Corporate Office (SP)

Tackling climate change

Legado das Águas,
Reservas Votorantim (SP)

Governance

To strengthen CBA's industry leadership in ESG practices, the Company's senior management is actively engaged around sustainability, including managing climate-related risks and opportunities. Learn about CBA's key governance bodies and their respective roles.

Board of Directors

The Board of Directors is appointed by the General Shareholders' Meeting to track the Company's performance and provide high-level direction. It is responsible for ensuring the sustainability of the business by adopting a long-term approach that integrates economic, social, environmental, compliance, and corporate governance aspects. The Board not only approves the Executive Board's targets but also monitors and approves their outcomes, including ESG-related targets such as greenhouse gas emission reductions. In 2023 the Board deliberated on various

climate-related issues, including the approval of the Company's 2030 ESG Strategy, updates on the carbon market landscape, and Company policies on Climate Change and Water Resources. Additionally, Board members of the Sustainability Committee regularly brief the full Board on the topics discussed in their meetings, ensuring alignment between the committee's discussions and the Board's decisions.

Sustainability Committee

The Sustainability Committee is a standing body that advises the Board of Directors on sustainability matters in line with its charter. It consists of four members, all with expertise in Sustainability, two of whom are independent. This committee convenes quarterly.

The Board **approves the Company's ESG targets**, including GHG emissions targets.



From left to right:
Fabrício Rissato, Mariana Godoy, and Paula
Cidale, employees at CBA's Head Office (SP)

Some of the matters on which the Committee has provided guidance include:

- 2030 ESG Strategy and progress on targets
- CBA's Alennium label and Digital Passport detailing product carbon footprints
- Assessing, monitoring and recommending improvements to policies
- Performance in ESG indices and ratings
- Corporate social responsibility strategy for recycling
- Developments in carbon market regulations
- Other climate change-related projects

Executive Board

The Executive Board ensures the alignment of all departmental programs, projects and initiatives with best sustainability practices. All Executive Board members participated in developing CBA's Board-approved 2030 ESG Strategy and in launching the Alennium label. They also play a role in climate change management.

- **Chief Executive Officer (CEO):** makes strategic and investment decisions; approves corporate sustainability goals, including climate commitments such as science-based targets (SBTi) and membership of the First Movers Coalition and the Net Zero Ambition Movement; since 2023, the CEO has served as spokesperson for SDG 13 – Climate Action within the Leadership with ImPact Program, as part of the UN Global Compact Network Brazil
- **Chief Financial (CFO) and Investor Relations Officer:** assesses sustainability-related risks and opportunities, including climate concerns, from a financial standpoint; oversees corporate risk management and approves ESG-related financing, CBA's Climate Agenda Report, and participation in ratings and indices, such as CDP
- **Supply Chain and Procurement VP:** identifies sustainability opportunities and risks, including those related to climate, in the supply chain; heads CBA's Sustainable Procurement Program; in 2023, the Supply Chain and Procurement VP approved climate change training for suppliers, the Company's scope 3 emissions inventory based on primary data, and the incorporation of climate change into the ESG assessments of suppliers and competitive procurement processes
- **VP, Human & Organizational Development, Health & Safety, Environment and Sustainability:** oversees the implementation and monitoring of the Company's 2030 ESG Strategy and its key sustainability projects, especially those addressing climate change; responsible for managing legal compliance, environmental monitoring, and maintaining ISO 14001 and Aluminium Stewardship Initiative (ASI) certifications; participated in the approval of the Climate Action Initiative and strategic sustainability matters, including indices, ratings, and Company commitments such as the Net Zero Ambition Movement and First Movers Coalition; in 2024, this role was extended to include Management Systems, with the

function being renamed to People and Culture while the teams of the Safety, Environment, and Sustainability functions now fall under the purview of the Chief Sustainability Officer, now renamed Chief Sustainability, Safety, and Environment Officer

- Engineering and Technology VP:** evaluates the deployment of innovations and technology in climate change-related projects—notable projects include Refinery boiler retrofits from fossil fuels to biomass and the Smelter upgrade; approves project prioritization methods that take account of carbon emissions and water usage; serves as sponsor on CBA's Climate Change Committee, championing new decarbonization initiatives
- Primary Products VP:** manages the initial stages of the aluminum production value chain, from mining to smelting; duties include incorporating operational and customer perspectives on sustainability; also responsible for scrap utilization in smelting and the implementation of other projects, such as the Smelter upgrade, boiler biomass retrofits, and the filter press project, all supporting the climate agenda
- Head of Downstream, Innovation and Digital Transformation:** manages the production and sale of semi-fabricated products (extruded and rolled) and oversees the Innovation and Digital Office; duties include incorporating operational and customer viewpoints on sustainability; also responsible for the co-creation of new products and solutions, monitoring the operational efficiency of downstream products, and leading projects like ReAl, a technology to recycle multi-layered packaging containing aluminum



CBA leadership



The Climate Change Committee
**is responsible for advising
the Executive Board** in
matters related to climate
adaptation and mitigation.

- **Legal, Governance and Compliance VP:** ensures the legal integrity of Board decisions, upholds the Organization's governance structure, and oversees compliance across all operations; duties include analyzing regulatory developments, including carbon pricing schemes such as the Carbon Border Adjustment Mechanism (CBAM) in Europe and Brazil's Greenhouse Gas Emissions Trading System (SBCE)

- **Energy Business VP:** manages the operation of power generation assets, joint ventures, and renewable energy procurement, including purchases of renewable energy certificates (RECs); leads the Company's transition towards sustainable energy solutions
- **Chief Sustainability, Safety, and Environment Officer:** oversees the Company's sustainability initiatives, including the climate agenda, 2030 ESG Strategy, and CBA's participation in ratings (CDP and MSCI), indices (ISE), sustainability evaluations (CSA), and ESG commitments (SBTi, Global Compact, and First Movers Coalition); manages social responsibility projects like the Climate Action Initiative and dam safety measures; beginning in 2024, the Environment and Safety functions fall under the purview of this role, reporting directly to the CEO

Climate Change Committee

Until 2022, CBA had an Executive Sustainability Committee that advised the Executive Board. In 2023, the matters under its responsibility were redistributed to other specialized committees. This led to the creation of the Climate Change Committee, which advises the Board

on climate adaptation and mitigation. This committee comprises subject-matter experts in different fields, including the Engineering and Technology VP, the Chief Sustainability, Safety, and Environment Officer, and managers from functions such as Sustainability, Technology, High Voltage and Rectification Management (overseeing energy efficiency), Smelters (the company's most carbon-intensive production stage), and Casting (responsible for recycling facilities). In 2023, the committee met quarterly, but recognizing the importance of this topic for the Company, meetings became bimonthly in 2024.

Throughout the year, discussions covered technological advancements, emission indicators, reduction targets, carbon capture and pricing projects, and the budget allocated to climate initiatives. Alongside the Climate Change Committee, CBA has other committees focusing on Water Resilience, Sustainable Supply, Innovation, and Dam Safety, each addressing different sustainability and climate resilience issues.

Organizational Structure supported by independent committees

Board of Directors

Remuneration &
People Committee

Statutory Audit
Committee

Finance
Committee

Sustainability
Committee

Executive Board

Diversity
Committee

Conduct
Committee

Data Protection
Committee

Crisis
Committee

Dam
Committee

Sustainable
Procurement
Committee

Innovation
Committee

Water
Resilience
Committee

Climate
Change
Committee

● Bodies involved in climate management



LEARN MORE

Further information about CBA's governance model is available on the Company's [Investor Relations website](#).

REMUNERATION TIED TO CLIMATE PERFORMANCE

To underscore the importance of sustainability, CBA has set corporate targets aligned with the 2030 ESG Strategy or all employees. Operational-level staff are eligible for the Company's Profit Sharing Program (PPR), where a committee of employees is elected at each site to set and track targets. ESG factors have been integrated into the PPR target framework. This program has also been discussed and agreed with relevant unions.

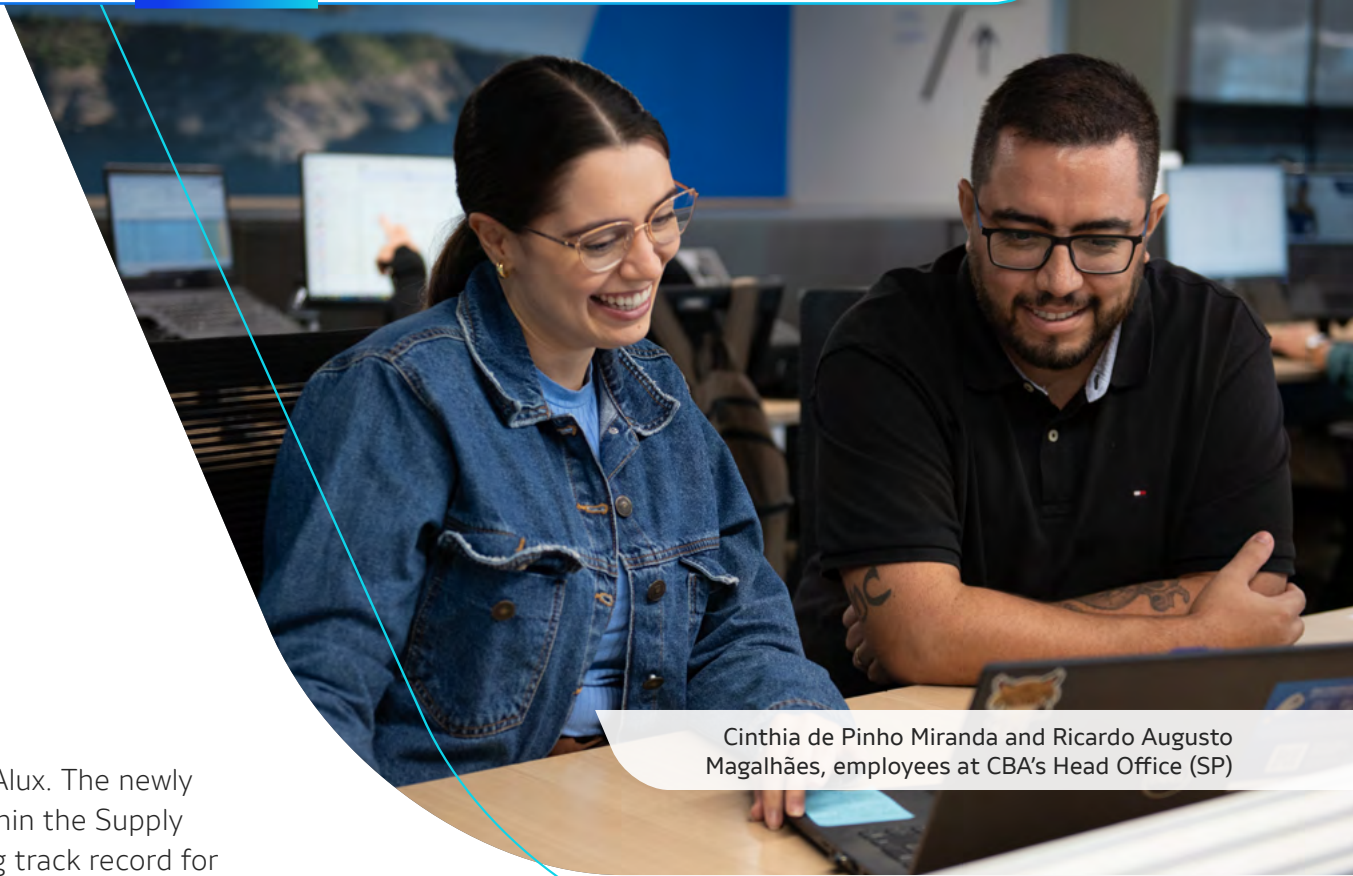
Professional (analysts, engineers, consultants, etc.) and leadership roles are eligible for variable compensation, with part of the targets being corporate-wide and part being specific to certain challenges. Within the corporate targets, CBA has cascaded ESG targets that include at least 5% of the target dashboards for the relevant roles and are tailored to the unique contexts of each department and the challenges listed in the ESG Strategy for the relevant year.

Employees in high-emission and decarbonization-critical process stages have associated reduction targets linked to the climate agenda. These include the Refinery (alumina production), Smelting (liquid aluminum production) and Casting

stages, including Metalex and Alux. The newly established Metals division within the Supply Chain department has a strong track record for decarbonizing sourced materials within scope 3.

Targets have also been set for energy efficiency, consumption of renewable energy, recycling, customer and supplier engagement around climate issues, and performance in sustainability indices such as CDP, ISE and CSA. The ESG target for Senior Leadership measures the average of consolidated results. This practice is outlined in the [Company's Remuneration Policy](#).

Furthermore, the Company has implemented a robust process for managing sustainability indicators and goals, with monthly oversight by the Board and quarterly reporting to the Sustainability Committee. For greater transparency, an internal business intelligence tool provides detailed results to the entire organization.



Cinthia de Pinho Miranda and Ricardo Augusto Magalhães, employees at CBA's Head Office (SP)

Engaging the value chain



CBA's efforts to engage the supply chain **are designed to generate positive business impact on people** while helping to mitigate risks.

Recognizing its position of industry leadership, CBA has implemented several programs to tackle climate change throughout its value chain, including suppliers, customers, communities and the wider climate agenda ecosystem.

SUPPLIERS

CBA's Sustainable Procurement Program works to engage the entire supply chain, generating positive business impacts on people and mitigating procurement-related risks. Climate change is embedded in the program, including the [Sustainable Procurement Policy](#),

in assessing the supplier's maturity during its approval, in the selection process, and in the purchase request, supplier development, and in the formulation of strategic partnerships.

In 2023, CBA worked to improve its approach to supplier climate assessments, with a primary focus on scope 3 emissions linked to sourced raw materials and logistics contracts. While the Company uses industry-leading databases to calculate scope 3 emissions (such as Ecoinvent, DEFRA and CRU's Emissions Analysis Tool), collecting primary data provides more accurate indicators. This also encourages a collaborative approach to supply chain decarbonization.

CBA has developed a pilot data collection form for priority raw material suppliers identified in the ESG screening process. This initiative has yielded promising results in emission management. In 2024 the form was also sent to priority logistics suppliers and, in the coming years, the Company anticipates extending the evaluation to all identified suppliers, supporting decisions on partnerships aligned with CBA's climate goals.

Miraí operation (MG)



In addition, training on climate management was provided to suppliers in a workshop to identify opportunities for collaboration. On the climate adaptation front, in 2023 CBA conducted a risk assessment for priority suppliers, covering 11 regions within and outside Brazil, using climate projections generated via the IPCC WGI Interactive Atlas tool.

These efforts have solidified CBA's reputation as an industry leader for climate engagement with the supply chain, earning recognition from the CDP's Supplier Engagement Leaderboard (SER) program.

CUSTOMERS AND PARTNERS

CBA seeks to cultivate close relationships with customers and to capture synergies with their operations. Learn about a selection of related initiatives below.



alennium

The mark of the new millennium hits the shelves

Alennium is a new label developed by CBA to certify its sustainable aluminum, made with minimal carbon emissions by using 100% renewable and traceable electricity. In 2023, CBA's emissions intensity was 3.23 tCO₂e/t liquid and aluminum at the smelting stage, which is 3.5 times lower than the global average across scopes 1 and 2 (read more about the Company's emissions performance on page 68).

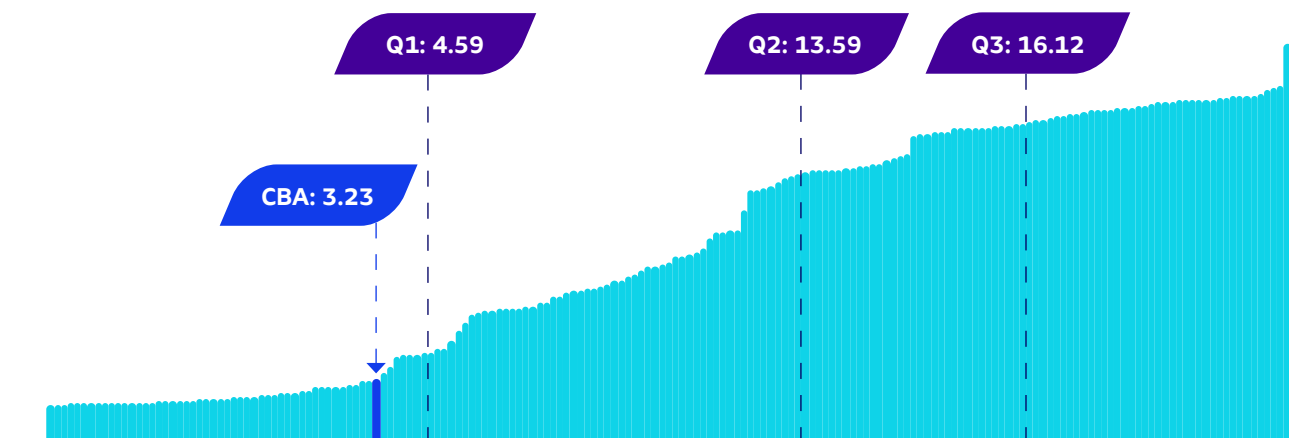


3.23

tCO₂e/t molten aluminum

CBA generates **3.5 times less smelter emissions** than the global average across scopes 1 and 2.

Smelter emissions intensity - 2023



Note: Smelter emissions intensity (tCO₂e/t molten aluminum) across scopes 1 and 2 (comprehensively) and scope 3 for purchased anode paste only. Source: CRU.

In 2023, the label was featured on products from five customers: Alumax, CDA Metais, Impacta, Pratsy and Wyda. In addition, CBA's Primora-branded aluminum profiles now also feature the label.

What the Alennium label certifies:

- Low carbon emissions (with an emissions intensity not exceeding 4 tCO₂e/t molten Al)
- 100% renewable and traceable electricity used in aluminum production
- Coverage by GHG reduction targets approved by the Science Based Targets initiative (SBTi)
- Integrated with CBA's environmental, social and governance initiatives

In addition to the new label, CBA offers a digital passport for some of its products, providing sustainability information that includes carbon intensity at each stage of the production process. All data is third-party-audited and the passports use blockchain traceability technology. This information can be featured on product packaging and literature via dedicated QR codes.

Ingots



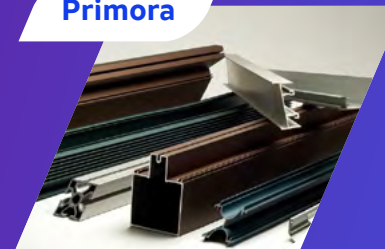
CBA billets



Metalex billets



Primora



Sheet



Packaging foil



LEARN MORE

Learn more about [Alennium](#) and CBA's [Digital Passport](#) on our website.

Lifecycle Assessment (LCA)

CBA first introduced Life Cycle Assessments (LCA) in 2018. This internationally recognized method is used to measure the potential environmental impacts of a product or service over its life cycle. In 2023, in response to customer and market demand, the company completed its first internal LCA Report.

The lifecycle assessment for products from the Alumínio plant was completed using SimaPro®, a software system with the most widely used database globally (EcolInvent). All lifecycle assessments, including those for Metalex and Itapissuma, have undergone third-party assurance and can be shared with customers.

Also in 2023, CBA collaborated with customers in the packaging sector to develop LCA assessments, with positive results. The assessment underscored one of main competitive differentiators of the Company's low carbon aluminum: its use of 100% renewable electricity. The assessment results support decision-making and comparisons between materials, products, or services.

Co-creating solutions

To achieve differentiation in a highly competitive market, CBA develops disruptive projects in collaboration with customers and partners through its Market Development and Innovation department. Co-creation and co-engineering projects collaborate with the innovation ecosystem to enhance safety, technology, performance and sustainability. These initiatives aim to address current needs while also anticipating and creating future opportunities. Many of these projects result in products with a reduced lifecycle carbon footprint.

Using design thinking-based governance and agile decision-making models, CBA developed 78 co-creation projects with customers in 2023. Learn about some of these projects below:

Aluminum for agribusiness

CBA supplied its first aluminum spray booms to two leading agribusiness brands in 2023. Developed at the Company's Solutions and Services Center, the aluminum booms provide a lightweight replacement for steel booms, improving efficiency. With a 30% longer length, these aluminum booms expand the spraying area. The resulting spraying equipment fuel savings can reduce carbon emissions by up to 14,000 tCO₂e.



Potential GHG reductions

through the use of CBA-made aluminum spray booms are as high as

14,000
tCO₂e

Examples of aluminum
applications

In diverse applications,
aluminum contributes to
**reducing vehicle weight and
fuel consumption**, leading to
lower GHG emissions.

Truck trailers

In collaboration with an automotive customer, CBA co-engineered a novel truck bed system made of aluminum. The material has a higher strength and can reduce vehicle weight by as much as 400 kg. By replacing steel and wood materials, the aluminum bed system minimizes environmental impacts and generates fuel savings, while reducing GHG emissions by up to 11.2 tCO₂e per vehicle.

Battery technology

CBA has continued to advance a project to develop applications for aluminum foil in lithium-ion batteries used in electric vehicles and electronic devices. A promising prototype has been developed in a collaboration with the SENAI Institute of Electrochemistry Innovation in Paraná. This project is supporting the transition to a low-carbon economy by enabling electric vehicles to replace combustion vehicles, resulting in reduced carbon emissions throughout their life cycle. Currently, lithium-ion batteries are imported as there is no local production in Brazil. This creates an opportunity for CBA to potentially support future local production.

Electric buses

Electric bus battery racks made of aluminum in replacement of steel can reduce rack weight by

60%, avoiding emissions of between 3.5 and 5 tCO₂e over each bus's lifespan, depending on the model. Currently, 50 vehicles operating in São Paulo have been fitted with the new aluminum rack system.

Aluminum bus roofs

This project developed a bus roof system made of aluminum in replacement of fiberglass. The new roof system offers improved overall finish, strength, and handling as well as fuel savings, and therefore lower emissions. Launched in 2022, the project produced a record 1,681 bus roofs in 2023, an increase of 42% compared to the previous year. The solution reduces weight by 100 kilograms and saves 4.25 tCO₂e per bus. The aggregate impact from the estimated number of buses produced annually is 7,144.25 tCO₂e.

New applications in the automotive market

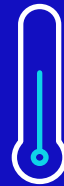
The company is currently developing a prototype aluminum alloy for brazed automotive radiators. The lighter weight aluminum reduces fuel consumption as well as engine wear by improving heat absorption and heat exchange efficiency. This type of alloy is currently not produced in Brazil. Local production has the added potential to reduce emissions from overseas shipping.

Event collaborations

Through its commercial departments, CBA actively participates in events and discussions with customers to demonstrate how its products can support their climate objectives. A case in point is the Company's partnership with the Brazilian Coffee Industry Association (ABIC) to offset the carbon emissions from the 29th edition of the ENCAFÉ event. This involved planting 2,624 native seedlings in Legado Verdes do Cerrado, a sustainable development reserve owned by CBA and managed by Reservas Votorantim. The activities over the five-day event, which gathered approximately 500 participants, including their air travel, resulted in emissions of around 9.92 tCO₂e.

COMMUNITIES

CBA recognizes climate change as a collective challenge affecting society at large, requiring engagement from all sectors. The Company also acknowledges that the most vulnerable sectors are often the hardest hit by crises, and that the interconnectedness of climate issues has serious local implications. For this reason, the climate agenda takes a prominent position among CBA's various social responsibility fronts.



Climate Action Initiative

At the 2023 Conference of the Parties, the Votorantim Institute launched its Climate Action initiative in collaboration with CBA and the Itaúsa Institute. This initiative aims to advance practical action to address climate change in Brazilian municipalities. The initiative comprises three main components:

Municipal Climate Vulnerability Index (IVCM)

The IVCM index assesses the climate vulnerability of all Brazilian cities to better target efforts to the most vulnerable regions. Developed using public databases, the index measures the likelihood of six risks: floods and flash floods; landslides; droughts; wildfires; agricultural disruptions; and increased health issues linked to climate change. The selection of risks and indicators underscores the vulnerabilities of communities and the specific ways they are affected. The IVCM for municipalities is available [here](#).



LEARN MORE
Visit the [Climate Action Initiative website](#).

Municipal Climate Adaptation Checklist

Designed primarily for public managers, technicians, and municipal government teams, this checklist provides a list of questions to help municipal governments identify their structural challenges related to climate adaptation. The questionnaire highlights the competencies that municipal governments should develop to bolster their climate resilience. The checklist can be accessed [here](#).

Public Management Support – Climate Action

A mentoring and technical advisory program that will support municipal governments in building their climate management capabilities. In 2024, CBA will work with two municipalities in its area of influence. The program is designed to run for 4 years, providing municipalities with tools and expertise to support their climate initiatives. The program is also expected to expand in the coming years.

Environmental Education Program (PEA) in Schools

The Environmental Education Program in Schools is a joint initiative by CBA and the Votorantim Institute to enhance understanding of environmental issues among public school students in the communities where CBA operates. This initiative helps to institutionalize environmental education with a focus on local biomes, social and environmental challenges, and regional diversity, as a way to enhance learning.

Besides providing training to school principals, teaching coordinators, and teachers, the project encourages student engagement and empowerment to address local social and environmental issues, including climate change, bridging the gap between the community, school, and environment. According to the

JUMA (Youth, Environment, and Climate Change) survey, environmental concerns rank among the top six issues for young people. A striking 8 out of 10 young individuals aged 18 to 24 believe there is a current climate crisis.

In 2023, the PEA program was implemented in four municipalities (Alumínio/SP, Araçariguama/SP, Ibiúna/SP, and Caçu/PE), involving 10 schools and benefiting 484 students directly. The program trained 17 school principals and 31 teachers, developed 23 lesson plans, and initiated 18 student-led projects (local environmental assessments). In 2024, alongside ongoing training sessions, the program will launch social and environmental projects based on student interests.

CLIMATE AGENDA ECOSYSTEM

Externally, CBA actively engages with associations and other groups in discussions around climate change. CBA's goal in this interaction is to share information, benchmark practices, and build partnerships to advance the climate agenda both in the market and in public policy. The organizations of which CBA is a member include:

- **Brazilian Aluminum Association (ABAL):** deals with matters relevant to Brazil's aluminum industry. ABAL's Sustainability Technical Committee discusses the climate agenda extensively, including the impact of carbon pricing on the aluminum industry. CBA's Chief Sustainability, Safety, and Environment Officer currently heads this committee
- **São Paulo Environmental Agreement:** encourages companies, trade associations, and municipal governments to voluntarily commit to reducing greenhouse gas emissions. Led by CETESB, the program includes an Environmental Chamber for Climate Change and various working groups. CBA is currently a member of the Tools, Methodologies, and Information Sharing working group
- **Aluminium Stewardship Initiative (ASI):** sets sustainability standards for the aluminum production chain. CBA is certified against the Performance and Chain of Custody standards and actively participates in ASI working groups, including the Climate Change Working Group

In 2023, the PEA in Schools program was implemented in four surrounding municipalities, involving **10 schools and benefiting 484 students directly.**

- **CDP Disclosure Insight Action:** mobilizes investors, companies, and governments to advance collaborative actions for sustainable development. Alongside ratings addressing climate change, water security, and forests, it has a member group (Benchmark Club), of which CBA is a member, that seeks to promote best environmental practices within companies
- **Brazilian Business Council for Sustainable Development (CEBDS):** promotes sustainable practices within businesses. CBA actively engages in CEBDS's Technical Chambers (CT) on Climate, Energy and Sustainable Finance, Water, and Biodiversity. In addition, the Company is a member of the Positive Impact initiative of the Action for Nature Platform, launched in 2023
- **First Movers Coalition (FMC):** a global movement to decarbonize the economy by creating future demand for low-carbon products from specific sectors. CBA has joined the select list of suppliers aligned with this movement through the First Suppliers Hub. Additionally, FMC has a dedicated working group on aluminum decarbonization, of which CBA is a member
- **Brazilian Mining Institute (IBRAM):** represents companies and institutions in the mining sector. CBA is a member of CEBDS's Climate & Carbon Working Group. In 2023, CBA supported the development of the 3rd GHG Inventory for the mining sector. Annually, CBA participates in an ESG assessment specific to the mining industry, in which we have performed strongly
- **International Aluminium Institute (IAI):** a global organization representing primary aluminum producers. CBA is an active member of the Greenhouse Gas Emissions Working Group and supports various initiatives surrounding the climate agenda, including emissions data reporting and Life Cycle Assessments (LCA)
- **Global Compact:** a UN corporate sustainability initiative focused on the business sector. Within the Global Compact, CBA is engaged around the Climate Action Platform, the Net Zero Ambition Movement, and other initiatives supporting the Sustainable Development Goals (SDGs)



Samanta de Moraes Xavier, a Downstream production operator at the Alumínio plant (SP)



“CBA is among the initial cohort of companies joining the First Movers Coalition (FMC), a global coalition led by the World Economic Forum and the United States government to advance the decarbonization of key sectors of the economy. **We were the first Brazilian company to join, illustrating our pioneering ethos.** In addition, in 2023, we joined a pilot supplier program led by the initiative, the First Suppliers Hub, which brings together companies nearing low-carbon production.”

Leandro Campos de Faria

Chief Sustainability, Safety,
and Environment Officer

Strategy

Sustainability is a core pillar in CBA's decision-making process and is considered in all strategic, managerial, and operational matters. Every three years, CBA conducts a Strategic Dialog, an exercise that takes a long-term view of the Company's business, with a focus on sustainability and climate agenda topics. One of the Company's strategic goals for the previous cycle was cementing its leadership position in ESG.

On an annual basis, CBA conducts a Strategic Planning (SP) exercise over a medium- and long-term horizon, in which projects are approved for execution in the upcoming years. As part of this exercise, ESG considerations are factored into project feasibility assessments. Sustainability initiatives hold significant weight in decision-making, ensuring that investments align with CBA's principles.

Strategic Pillars



ALUMINUM SOLUTIONS THAT
TRANSFORM LIVES



**Accelerate
growth**



**Build
competitiveness**



**Drive innovation
and collaboration**



**Cement our leading
ESG position**

CAPEX assessments for engineering projects and upgrades consider impacts on natural resources, greenhouse gas emissions, carbon pricing, and waste. Competitiveness Management exercises, focused on process improvement, take into account sustainability benefits such as reduced utilities use, waste, and emissions, and increased safety. These aspects are also addressed in portfolio management by PODs (multidisciplinary teams who work on specific themes for a defined period of time), where ESG is among the prioritization levers in deciding which projects to explore.

By strategically integrating sustainability into all operations, CBA reaffirms its commitment to contributing to a more sustainable future, balancing economic growth with environmental preservation and positive social impact.

2030 ESG Strategy

CBA's 2030 ESG Strategy is designed to support the Company's ambition to deliver low-carbon aluminum products and sustainable solutions while upholding ethics and corporate social responsibility. Launched in 2020 and further updated in 2022, this strategy outlines ten core thematic pillars: five environmental, two social, and three governance pillars, as well as a cross-cutting pillar on ESG Communication. These pillars are further broken down into 15 programs and 33 targets that apply to employees across all company levels.

CBA's 2030 ESG Strategy places a specific focus on climate change, although it also intersects with other areas such as renewable energy, circular aluminum, and natural resource management.

Mandate: Delivering an offering of low-carbon aluminum products and sustainable solutions in collaboration with stakeholders, while developing the communities where the Company operates and positively influencing the end-to-end aluminum value chain.

2030 ESG Strategy levers



2030 ESG Strategy

Lever	Program	Commitments	Related SDGs
Environmental Dimension			
 Climate change	P1. Climate mitigation and adaptation	1.1 Reduce CO ₂ e emissions by 40% (on average for cast products, cradle-to-gate) 1.2 Offer customers a carbon-neutral product range 1.3 Create a roadmap to becoming emissions neutral by 2050 1.4 Develop a climate change adaptation plan 1.5 Provide government management support in climate mitigation and adaptation	
 Renewable energy	P2. Renewable generation	2.1 Source 100% of plants' power requirement from renewable sources 2.2 Diversify renewables capacity beyond hydro	
	P3. Energy efficiency	3.1 Reduce energy intensity (electricity and fuels)	
 Circular aluminum	P4. Aluminum recycling	4.1 Increase the ratio of aluminum recycled from industrial and end-of-life scrap at Metalex (SP) to 80% 4.2 Increase the ratio of aluminum recycled from industrial and end-of-life scrap in billet production at the Alumínio (SP) plant to 50% 4.3 Increase the ratio of scrap collected from external sources for recycling	
	P5. Carton and flexible packaging recycling	5.1 Recycle 40,000 metric tons of cartons and flexible packaging per year	
 Natural resources	P6. Water stewardship	6.1 Reduce water withdrawals per metric ton of molten aluminum by 20% 6.2 Implement water stewardship initiatives to improve water security in partnership with stakeholders	
	P7. Biodiversity	7.1 Create/expand 1 hectare of ecological corridors for every 10 hectares of mined and reclaimed land 7.2 Have 10% of key suppliers and customers co-investing in forest and biodiversity programs	

Blue levers – those directly related to the climate agenda.

Purple levers – those with some degree of impact on climate mitigation or adaptation.

Lever	Program	Commitments	Related SDGs
Dams	P8. Waste dams	8.1 Eliminate tailings/residue disposal in dams 8.2 Send 100% of dry red mud residue for use in cement production and other applications	
Social dimension			
Valuing people	P9. Diversity, equity and inclusion P10. Health and safety	9.1 Achieve 25% gender diversity in leadership positions (managers or above) by 2025 10.1 Zero fatalities or severe injuries* in operations 10.2 Achieve an injury frequency rate lower than 1**	
Social legacy	P11. Social legacy	11.1 100% Service Level Agreement (SLA) conformity in social programs 11.2 Secure 1-to-1 match funding from co-investors for corporate social investment 11.3 Contribute to strengthening recycling cooperatives in Brazil	

* Fatal injuries or injuries resulting in permanent disability (tiers I and VI)

** Based on 1 million MHW

Purple levers – those with some degree of impact on climate

Lever	Program	Commitments	Related SDGs
Governance dimension			
 Sustainable value chain	P12. Sustainable Procurement	12.1 100% of suppliers compliant with CBA's Sustainable Procurement Policy 12.2 Increase local sourcing by 10%	
	P13. Sustainable solutions for customers	13.1 100% of billets produced at Metalex with greenhouse gas emissions lower than 1.4 tCO ₂ /t 13.2 Higher revenues from sustainable solutions for downstream customers	
 Ethics and transparency	P14. Ethics and transparency	14.1 Achieve an average rating of 4 for CBA's third-party-audited Compliance Program	
 ESG ownership	P15. ESG ownership	15.1 100% of operations certified to the ASI Performance and Chain of Custody standards 15.2 100% of employees to have assigned ESG targets 15.3 Apply ESG criteria in 100% of funding and investment decisions	
Cross-cutting dimension			
 Communication	ESG Communications	Achieve and maintain an "Excellent" RepTrak® score	

Purple levers – those with some degree of impact on climate

Climate-related funding

CBA has a funding plan for and is investing in CAPEX projects aimed at reducing GHG emissions. This plan underscores CBA's commitment to incorporating climate and environmental considerations into its operations to enhance sustainability and operational efficiency.

Major CAPEX investments are planned across three key areas, each addressing specific strategic objectives for CBA:

Increased production of primary aluminum



R\$ 1,198

- Early restart of Pot Room 3
- Restart of Pot Room 1

Upgrades and ESG initiatives



R\$ 1,247

- Smelter upgrade
- Dry residue disposal

Recycling expansion



R\$ 428

- Sidewell furnace installed at Metalex, raising capacity from 75 ktpa to 90 ktpa
- Scrap Treatment Line
- ReAl Project
- Alux acquisition

 Total investment (in million)

Recycling **reduces emissions and primary inputs**, as well as creating job and income opportunities.

In 2024, recycling will remain one of CBA's core investments, helping to advance the circular economy, emissions reduction, reduced consumption of inputs, and increased production. The company also recognizes the transformative potential in job creation, income generation, and formalizing the scrap supply chain.

In 2024, two innovative projects are set to start operation: ReAl and dry residue disposal using filter presses. The year ahead will be one of learning, execution, and innovation, and the Company anticipates important milestones for its future growth.

ACCESS TO CAPITAL

Since 2020, the Company has increasingly secured project finance from green bonds or sustainability-linked loans. CBA is the first

company in Brazil to issue Green Export Credit Notes with the proceeds linked to sustainable export-oriented projects. In 2021, CBA issued its first green debentures worth R\$ 230 million, directing the proceeds to projects focused on improving its production facilities' environmental performance.

Between 2022 and 2023, CBA secured a revolving credit line of US\$ 100 million and raised over R\$ 1 billion through Sustainability-Linked Loans, with debt-service costs conditional on achieving specific performance targets. These targets include greenhouse gas emissions reductions in primary aluminum production as part of CBA's 2030 Industry Strategy, supported by the loan proceeds.

Each of these loans received a Second Party Opinion (SPO) from a prestigious organization. As part of its commitment to accountability, the Company annually publishes a Use of Proceeds and ESG Performance Report on its [Investor Relations website](#), detailing progress on green loan-funded projects and the Company's performance against emissions indicators.

In 2022, CBA also entered into agreements with BNDES for sustainability-linked credit facilities drawn from the Climate Fund to finance environmentally impactful projects, and an agreement with FINEP to finance the Company's strategic innovation plan with an ESG focus.



More than
R\$ 1 billion
raised between
2022 and 2023
through ESG-Linked Loans.

This financial strategy led to 42% of the gross debt being channeled into projects with positive environmental impacts or tied to sustainability performance indicators, underscoring the Company's commitment to embedding climate and environmental considerations into its business operations, aiming for sustainability and operational excellence.

CARBON PRICING

CBA has implemented an internal carbon pricing system to assess the implications of both national and international carbon pricing regulations for its operations. Within this framework, the Company has adopted a shadow pricing methodology supporting targeted, comprehensive assessments based on inputs from discussions on Brazil's carbon market and the European CBAM.

Following scenario assessments for the period from 2025 to 2036, the internal carbon price was determined at R\$ 43.69. This pricing informs the Company's financial assessments, risk assessments, and decisions related to CAPEX projects, Competitiveness Management (GC),

and Market Development and Innovation (DMI). The assessment factored in the following assumptions:

- a 50% deduction of free allowances from the total emission value to be reconciled
- carbon pricing introduced by 2025 in Brazil and by 2026 for the EU CBAM, with gradual increments in permit values
- the Company's current export profile
- future emission projections considering decarbonization initiatives
- use of offsets capped at 20% of the total reconciled emissions value

The carbon pricing strategy has shown minimal financial impact on CBA's operations, especially when compared to similarly-sized global industries. This advantage stems from the Company's low emission intensity in primary aluminum production, particularly in scope 2 emissions, thanks to a primarily renewable energy mix.



Shadow pricing definition

According to the CDP, a shadow price ascribes a hypothetical value to each metric ton of CO₂e emitted. While useful for investment decisions or budgeting purposes, it does not result in actual financial flows to the Company.



Climate scenarios

Climate scenarios are projections of potential future climate conditions, used as tools to understand both risks and opportunities. They enable more effective and adaptable management through informed decision-making. CBA's analysis was informed by five physical climate scenarios (RCP 4.5, 8.5, 2.6, 6.0, and 7.0) and one transitional scenario (BNEF NEO). Below, we describe the scenarios and the platforms used for the calculations.

PHYSICAL SCENARIOS

For the physical scenarios, CBA used four tools (AqueDuct by WRI, INPE, WWF's Water Risk Filter, and IPCC WGI Interactive Atlas) to structure its analysis, focusing on climate change projections specific to its operations. The analysis covered variables such as temperature, rainfall, drought risk, seasonal variability, water stress, wind patterns, floods, consecutive dry days, and cumulative rainfall. All identified risks come with assigned mitigation measures, as outlined in the [Risk management](#) section.



Wesley Dourado Fernandes, an engineer at Legado Verdes do Cerrado, Goiás (GO)

Area	Geographical characteristics	Temperature	Precipitation	Water Stress	Wind
Area A	Operations: Alumínio and Sorocaba facility (SP) Distance: 21 km (linear) Basin: Tietê 2	2040: 5% increase 2070: 10% increase	PR: +3% (2030) → -8% (2050) SV: Increase to medium-high CR: +3% (2040) → +9% (2070) Drought: Medium-high DD: -3% (2040) → -2% (2070) Floods: Increase to very high	Low → Medium-low (2030 and 2040)	2.4% average increase in wind speeds
Area B	Operation: Alux (SP) Basin: Piracicaba	2040: 5% increase 2070: 10% increase	PR: +5% (2030) → -8% (2050) SV: Increase to medium-high CR: +3% (2040) → +9% (2070) Drought: Medium DD: -3% (2040) → -2% (2070) Floods: Increase to very high	Medium-low (Baseline, 2030 and 2040)	2.4% average increase in wind speeds
Area C	Operation: Metalex (SP) Basin: Tietê 2	2040: 5% increase 2070: 10% increase	PR: +4% (2030) → -6% (2050) SV: Increase to medium-high CR: +3% (2040) → +9% (2070) Drought: Medium DD: -3% (2040) → -2% (2070) Floods: Increase to very high	High → Medium-low (2030 and 2040)	2.4% average increase in wind speeds
Area D	Operation: Itapissuma (SP) Basin: East Atlantic Coast	2040: 3% increase 2070: 7% increase	PR: -4% (2030) → -13% (2050) SV: Increase to high CR: +4% (2040) → +8% (2070) Drought: Medium DD: +3% (2040) → +9% (2070) Floods: Increase to very high	Medium-high → High (2030 and 2040)	2.6% average increase in wind speeds
Area E	Operations: Miraf and Itamarati de Minas (MG) Distance: 54 km (linear) Basin: Muriaé and Pomba	2040: 5% increase 2070: 10% increase	PR: +0.4% (2030) → -6% (2050) SV: Maintained at medium-high CR: +3% (2040) → +9% (2070) Drought: Medium DD: -3% (2040) → -2% (2070) Floods: Increase to very high	Low (2030 and 2040)	2.4% average increase in wind speeds

Legends:
PR – Precipitation | **SV** – Seasonal Variation | **CR** – Cumulative Rainfall | **DD** – Consecutive dry days

Area	Geographical characteristics	Temperature	Precipitation	Water Stress	Wind
Area F	Operation: Poços de Caldas (MG) Basin: Pardo 2	2040: 6% increase 2070: 12% increase	PR: +5% (2030) → -10% (2050) SV: Increase to high CR: +3% (2040) → +9% (2070) Drought: Medium DD: -3% (2040) → -2% (2070) Floods: Increase to very high	Medium-low (2030 and 2040)	2.4% average increase in wind speeds
Area G	Operations: Paranapanema Complex (Boa Vista, Rio Novo, Piraju and Ourinhos /SP) Distance: 100 km (linear) Basin: Upper and middle Paranapanema	2040: 6% increase 2070: 9% increase	PR: +3% (2030) → -9% (2050) SV: Increase to medium-low CR: +3% (2040) → +9% (2070) Drought: Medium-high DD: -3% (2040) → -2% (2070) Floods: Increase to very high	Low (2030 and 2040)	2.4% average increase in wind speeds
Area H	Operations: Juquiá Complex (Franca, Fumaça, Barra, Alecrim, Porto Raso, Serraria, Iporanga /SP) Distance: 63 km (linear) Basins: Ribeira do Iguape	2040: 6% increase 2070: 9% increase	PR: +0.5% (2030) → -4% (2050) SV: Increase to medium-low CR: +3% (2040) → +9% (2070) Drought: Medium-high DD: -3% (2040) → -2% (2070) Floods: Increase to very high	Low (2030 and 2040)	2.4% average increase in wind speeds
Area I	Operations: Sorocaba Complex (Ituporanga, Votorantim, Santa Helena and Jurupara /SP) Distance: 48 km (linear) Basin: Sorocaba, Middle Tietê and Ribeira do Iguape	2040: 5% increase 2070: 10% increase	PR: +3.5% (2030) → -9% (2050)* SV: Increase to medium-high CR: +3% (2040) → +9% (2070) Drought: Medium-high DD: -3% (2040) → -2% (2070) Floods: Increase to very high *except Jurupara (-4%/2050)	Low (2030 and 2040)	2.4% average increase in wind speeds
Area J	Operation: Salto do Rio Verdinho (GO) Basin: Paraíba do Sul	2040: 5% increase 2070: 9% increase	PR: +1% (2030) → +4% (2050) SV: Increase to high CR: +4% (2040) → +7% (2070) Drought: Medium DD: +12% (2040) → +14% (2070) Floods: Low	Low (2030 and 2040)	5.6% average increase in wind speeds

Legends:

PR - Precipitation | **SV** - Seasonal Variation | **CR** - Cumulative Rainfall | **DD** - Consecutive dry days

Area	Geographical characteristics	Temperature	Precipitation	Water Stress	Wind
Area K	Operation: Sobragi (GO) Basin: Paraibuna	2040: 5% increase 2070: 10% increase	PR: +3% (2030) → -3% (2050) SV: Increase to medium-high/high CR: +3% (2040) → +9% (2070) Drought: Medium DD: -3% (2040) → -2% (2070) Floods: Increase to very high	Low (2030 and 2040)	2.4% average increase in wind speeds

Legends:
PR – Precipitation
SV – Seasonal Variation
CR – Cumulative Rainfall
DD – Consecutive Dry Days

Note: The water stress category was determined using the AqueDuct (WRI) tool, employing a percentage scale that spans from low (<10%) to medium-low (10–20%), medium-high (20–40%), high (40–80%) and extremely high (80–100%).

TRANSITION SCENARIO

To determine transition scenarios, CBA drew upon energy transition studies to anticipate global investments towards a low-carbon economy. This analysis helped identify potential investments in specific technologies and outlined the risks and opportunities tied to market behavioral shifts and their impact on the Company's operations.

Historical data revealed a 31% increase in energy transition investments in 2022 compared to 2021, on the back of the ongoing decarbonization drive. In terms of emissions, investments of 11 trillion USD were made in the year toward achieving net zero, a sixfold increase from the previous year.

Globally, the most heavily invested categories were:

- **Renewable energy:** accounting for 45% of the year’s investment, with solar energy comprising over 36% of this category’s total investment
- **Electric vehicles:** 42% of investment
- **Hydrogen:** investments increased threefold and the number of projects doubled (1,046 globally and 40 in Brazil).
- **Carbon capture:** doubled in 2022

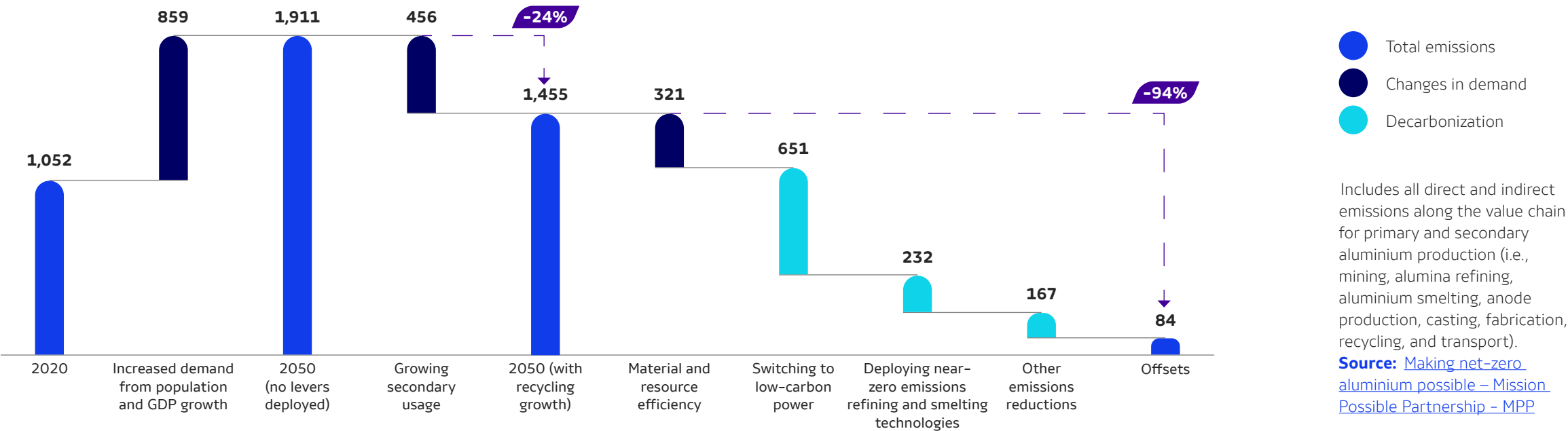
Sources: New Energy Outlook 2022 – BNEF.
Energy Transition Investment Trends 2023 – BNEF.
Making net-zero aluminium possible – Mission Possible Partnership – MPP.

Looking at the scenarios through 2050, the momentum behind clean energy, the electrification drive, progress in energy efficiency, and a push for increase recycling will play a significant role in shaping global market dynamics. As technology advances and costs decline, the prospects for technologies like hydrogen and carbon capture are set to improve, with long-term costs expected to decrease.

A closer examination of progress in renewable energy indicates that wind and solar energy will likely experience the most significant growth, leading to a decline in GHG emissions from fossil fuels such as coal and natural gas. Aluminum is poised to be a linchpin in the global energy transition, playing a vital role in electrification and renewable energy generation. Consequently, a rise in aluminum consumption is anticipated.

While growth in aluminum production is anticipated to be largely supported by increased recycling, substantial investments are needed for decarbonizing primary aluminum production. This decarbonization is projected to be driven by a heightened uptake of renewable energy, coupled with innovative technologies in smelting, refining, and other mitigation strategies.

Net zero pathway for the aluminum industry (in thousands of tCO₂e/year)



The primary decarbonization investments in the aluminum sector will be directed towards transitioning to renewable energy sources, making up 69% of the total expected investment from 2020 to 2050. This includes switches to grids and purchased electricity (42%), captive power generation (24%), and utilization of green hydrogen (3%). Investments in decarbonizing the refining and smelting processes account for 32% of the total.

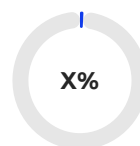


69%

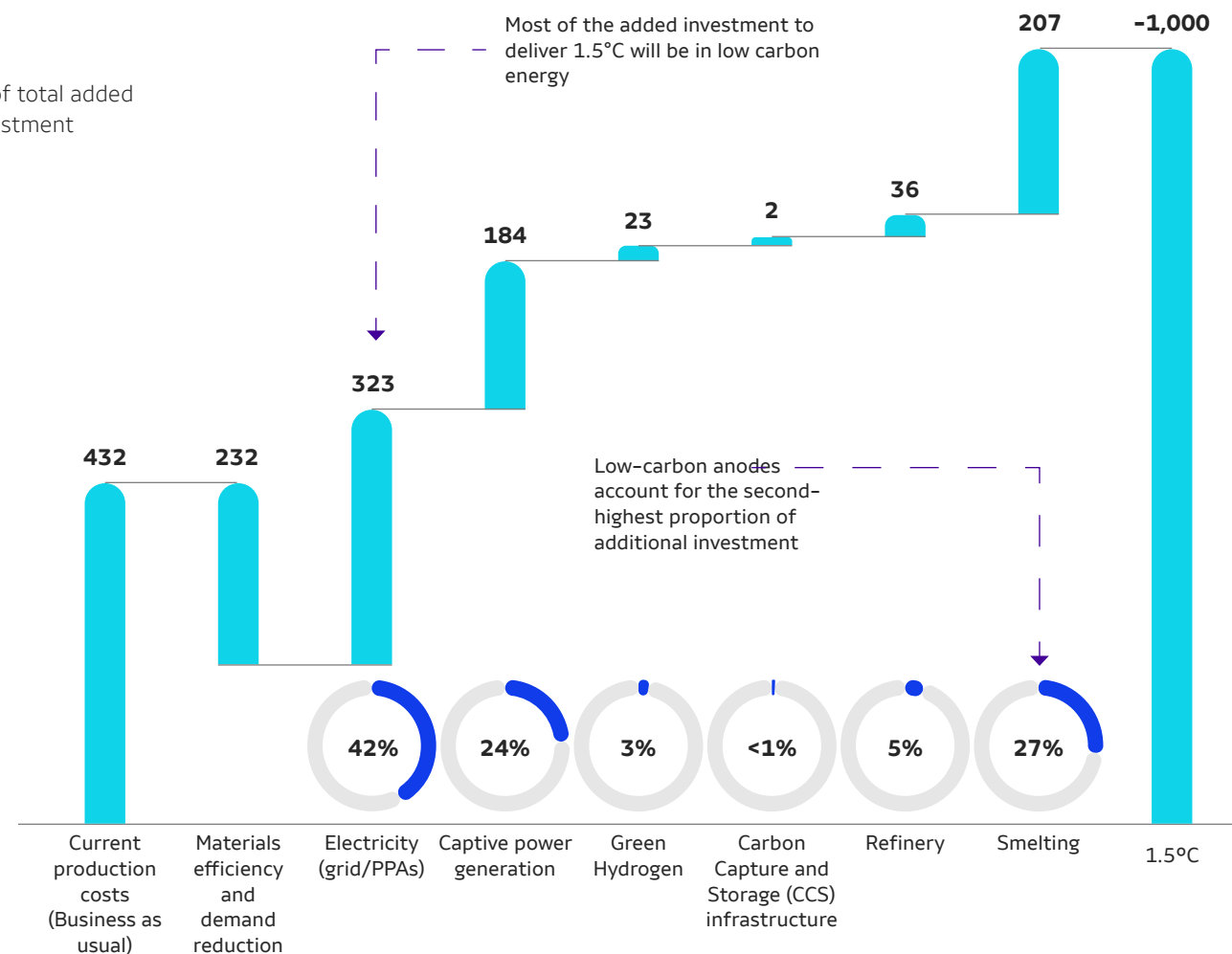
of decarbonization investments in the aluminum sector **will go toward the energy transition.**

Cumulative investment in primary aluminum production from 2020 to 2050 (in billions of dollars)

Legend:



% of total added investment



Source: [Making net-zero aluminium possible – Mission Possible Partnership – MPP](#)

Risk management

CBA follows industry best practices in risk management. The Company draws guidance from ISO 31000 on effective risk management and employs the COSO Enterprise Risk Management framework.

CBA's Risk Management Policy, which outlines guidelines and responsibilities on this topic, has been approved by both the Executive Board and the Board of Directors. The policy also draws inputs from:

Company governance guidelines and bylaws

Applicable standards issued by the Brazilian Securities Commission (CVM)

B3 Novo Mercado listing rules

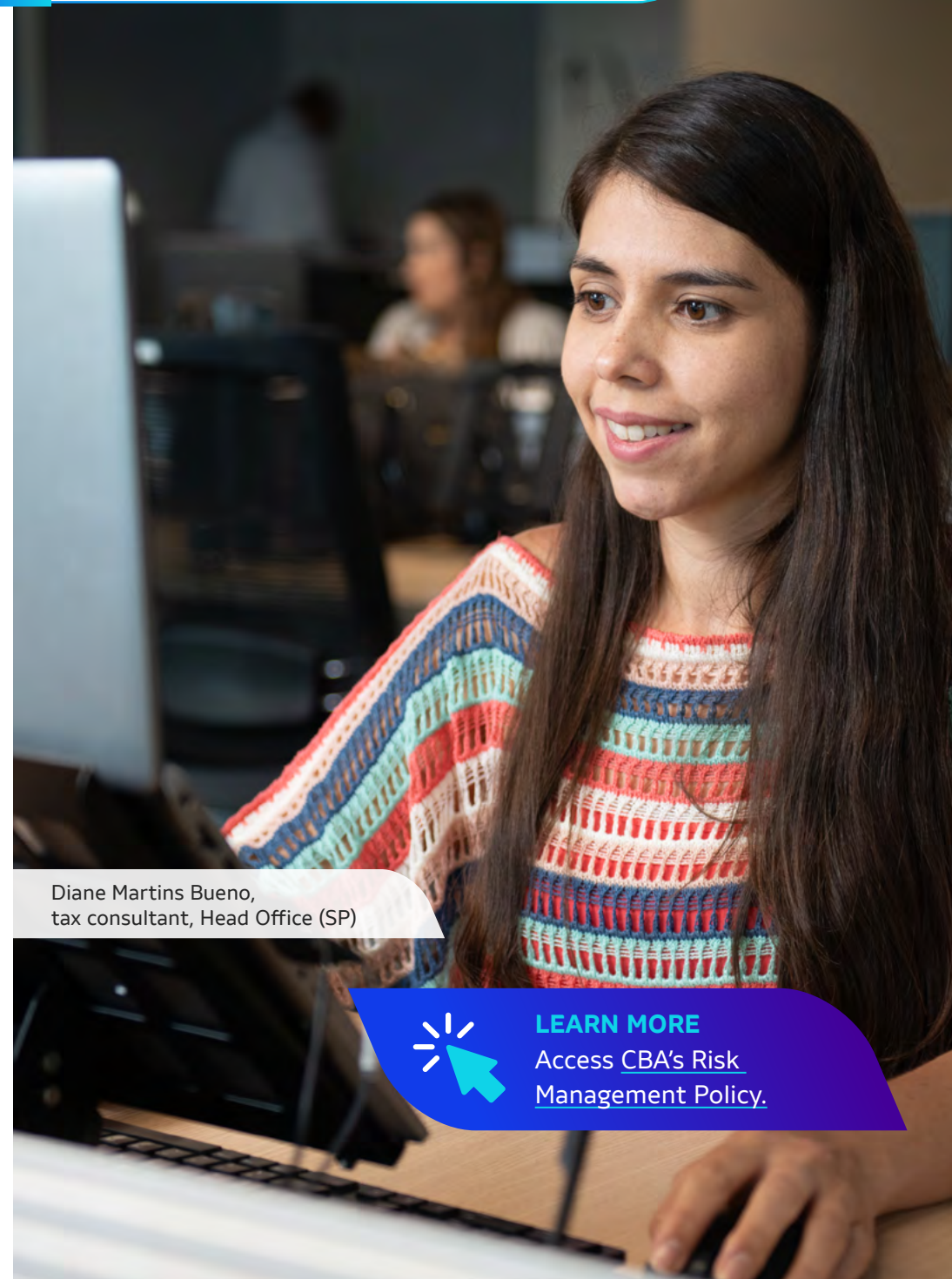
Principles outlined in the Company's Code of Conduct, as well as the charters of the Statutory Audit Committee and the Board of Directors

Diane Martins Bueno,
tax consultant, Head Office (SP)



LEARN MORE

Access [CBA's Risk Management Policy](#).





CBA's definition of risk

CBA defines “risk” as the potential for an event to occur that could adversely impact its ability to achieve business objectives. “Risk management,” in turn, is defined as a coordinated set of activities aimed at directing and controlling risk-related actions, with the goal of creating and preserving value, enhancing performance, driving innovation, and supporting the Company's strategic objectives.



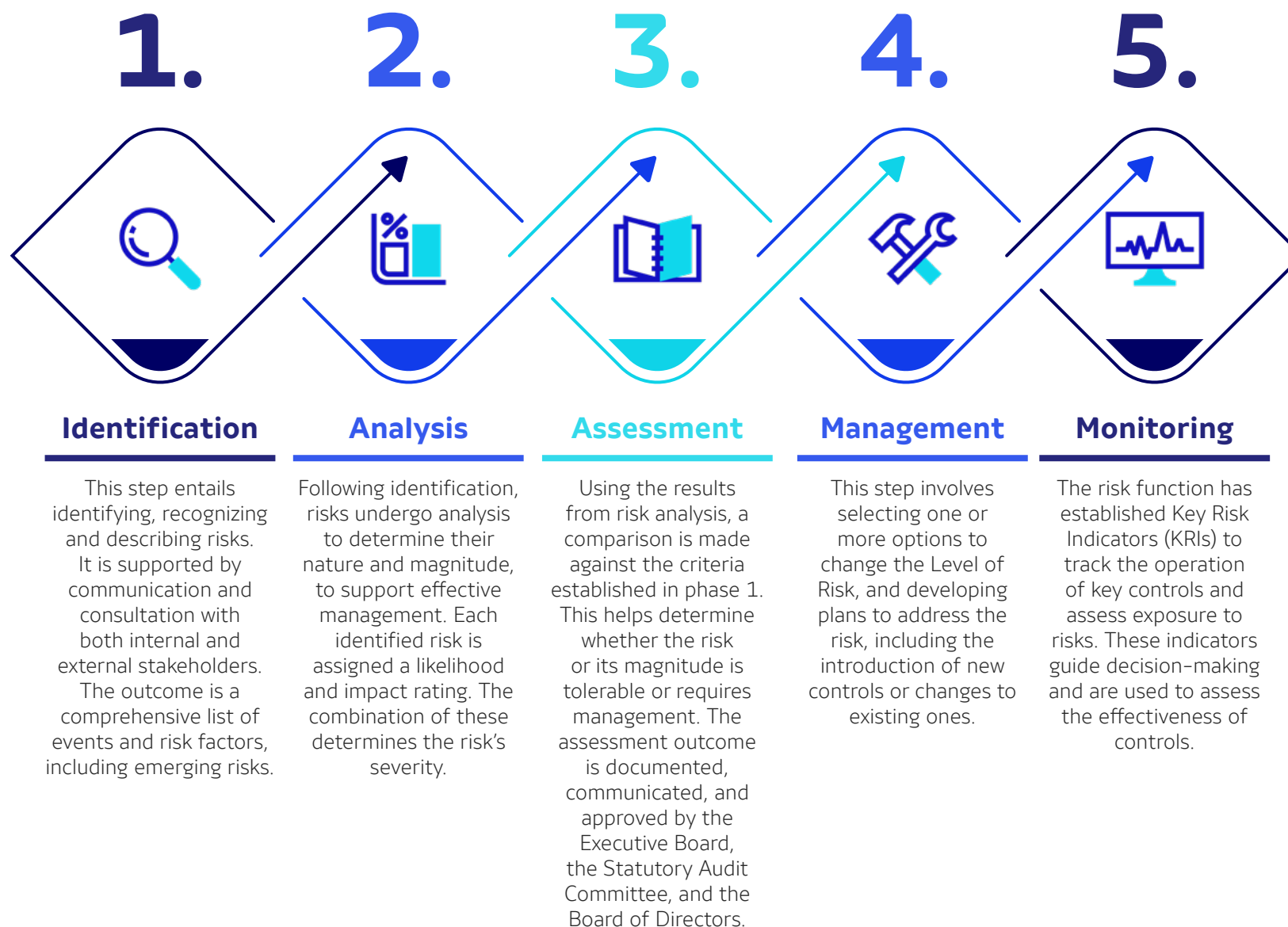
Eliane Pereira Brito, production operator, Alumínio plant (SP)



LEARN MORE

Identified climate risks have corresponding mitigation actions and are documented in the Company's Risk Map ([page 52](#)).

Risk management steps



Effective since 2020, CBA's Risk Management Policy undergoes regular reviews or updates as required by internal governance. In 2024, the risk management process will be audited to secure an independent opinion and inform needed improvements.

Climate-related risks, including emerging risks, undergo the same process of identification, analysis, assessment, management, and monitoring as other corporate risks, and are reviewed annually. The Company takes a conservative approach in projecting adverse scenarios.

Factors considered

CBA’s approach to risk management takes into account both existing and emerging regulatory requirements related to climate change throughout all stages of the process. Other factors considered include technological developments and reputational risks.

Factor	Explanation
Current regulations	Poses no significant risks. Although reporting is only mandatory for Scope 1 and 2 emissions, the Company reports its complete inventory in the Public Emissions Registry. The Company views this disclosure as crucial for ensuring transparency and strengthening its leadership position in sustainability. Regulatory developments and market best practices are closely monitored. An extreme risk for CBA would be changes in current regulations potentially disrupting its operations
Emerging regulations	This risk could create significant financial impacts for the Company, given that CBA has processes that generate direct emissions, albeit at low levels compared to other primary aluminum producers worldwide. This risk may include EU mechanisms like CBAM or national ones. In Brazil, the introduction of carbon pricing is being considered and may be enacted in new regulations
Technological	With the introduction of new, emission-competitive technologies, older ones become disadvantaged in carbon pricing systems. This might necessitate adaptation and investments or lead to increased product costs, making CBA less competitive
Market	Worldwide, aluminum manufacturing is stigmatized as being energy-intensive and carbon-intensive when using fossil fuel-based energy sources. As a result, some customers could be led to seek alternative materials to aluminum. While CBA produces low-carbon aluminum, the above risk, if materialized, could affect business performance and revenues
Reputational	Negative impacts could include loss of market share and drops in stock prices. CBA strives to set sustainability standards and is committed to providing low-carbon aluminum and sustainable solutions to customers and is advancing initiatives to demonstrate the benefits of producing low-carbon aluminum
Physical, acute	CBA has conducted climate projections for all its facilities to increase resilience against acute physical risks. One such risk is potential impacts on critical suppliers from acute climate events, affecting the availability of production-essential materials
Physical, chronic	CBA has conducted climate projections for all its facilities to increase resilience against chronic physical risks. These projections assess the risk of drought and reduced rainfall, potentially leading to a water crisis that could limit the use of water in CBA’s operations. Water shortages could also impact communities, prompting government reductions in industrial water allocations and potentially limiting Company operations

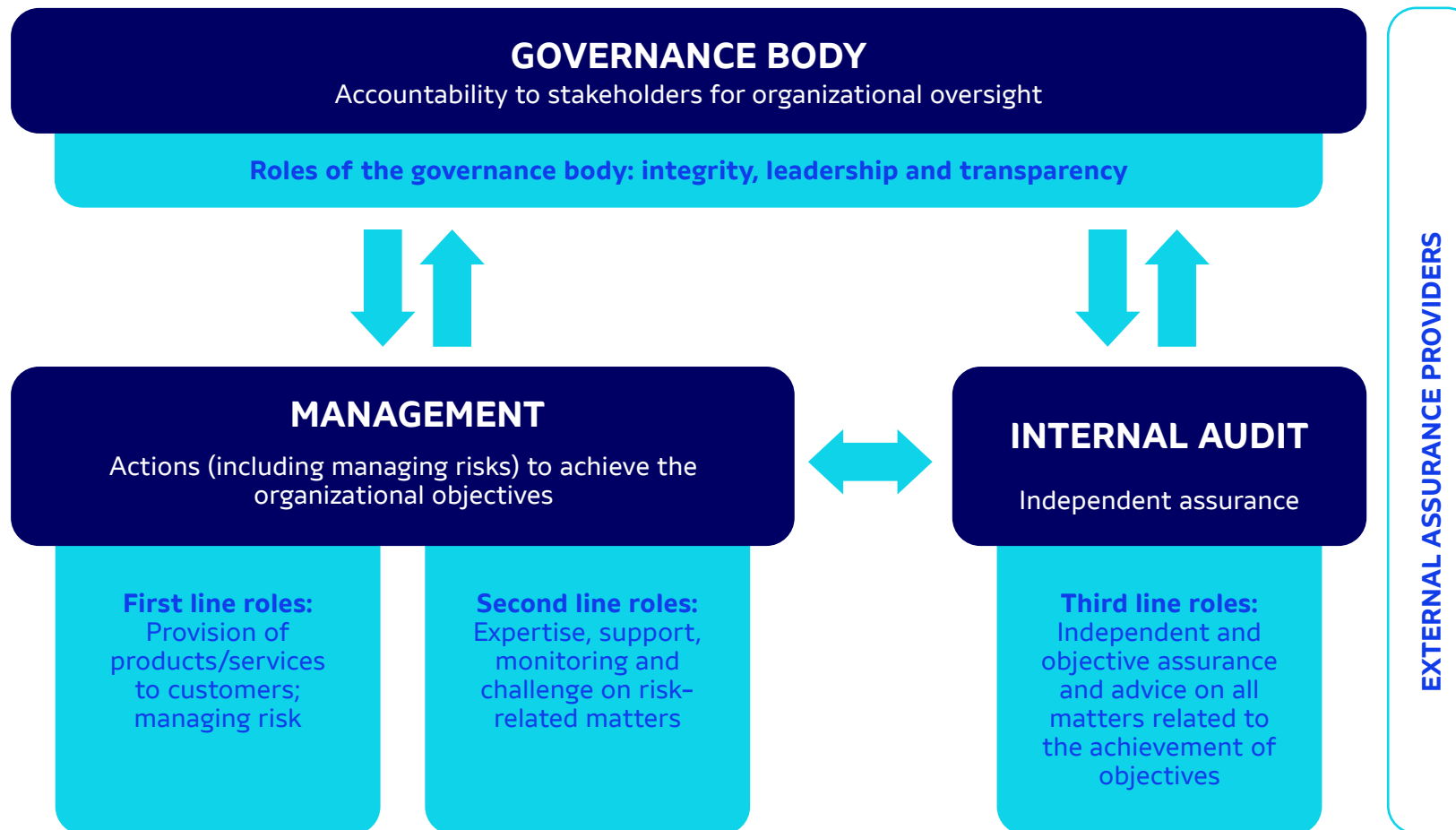
Responsibilities for risk management

Beyond the Risk Management function, other functions play a role in managing risks specific to their domains. The Company defines and clarifies roles and responsibilities using the Three-Lines Model, which includes business functions, functions tasked with managing risks, and the internal audit. This model enhances coordination and information sharing.

Legend:

- ↓ Delegating, guiding, approving resources, and overseeing
- ↑ Reporting
- ↔ Aligning, communicating, coordinating, and collaborating

The Three Lines Model



Business functions document risk management details on cards, noting factors that could lead to the risk event occurring. Regarding climate-related risks, the risk owner (reporting directly to the CEO) must provide comprehensive information on how climate factors could amplify the risk's impact or likelihood, including potential financial and mitigation implications. The Sustainability function provides support in detailing climate risks and developing action plans.

The individual overseeing climate risk management must **provide information on impacts** (including financial and mitigation aspects) and the likelihood of these risks materializing.

Risk mapping

CBA assesses all risks, including those related to climate, on an impact scale that considers eight types of impact: financial, reputational, environmental, health and safety, information security, operational, social and human rights, legal, and regulatory. For climate-related risks, the following applies:

- **Financial impact:** the potential financial consequences of risks, such as effects on revenues and expenses. For 2023, the classifications used were:
 - **Minor:** impact less than R\$ 27 MM
 - **Moderate:** R\$ 27 to R\$ 54.5 MM
 - **Major:** R\$ 54.5 to R\$ 109 MM
 - **Extreme:** greater than R\$ 109 MM
- **Reputational impact:** considered strategic when there is negative exposure at a local level affecting a specific stakeholder group. It changes to extreme when it affects critical customers or suppliers, or when long-term damage could occur due to national or international negative exposure
- **Environmental impact:** deemed strategic if it involves an environmental liability event. It changes to extreme when it becomes financially unfeasible to reverse damages to species, habitats, and ecosystems, jeopardizing operational continuity
- **Social and human rights impact:** deemed strategic when it affects a specific neighborhood or community, compromising residents' economic, environmental, or physical well-being. It changes to extreme when it causes significant regional impacts, resulting in enduring or permanent changes
- **Health and safety impact:** considered significant when it affects employees. The classification changes to extreme in the event of any severe injuries or fatalities
- **Information security impact:** potential impacts on the confidentiality, integrity, and availability of information. This risk is classified as extreme when there is a risk of confidential information being leaked, compromising data integrity or causing prolonged unavailability of information

- **Operational impact:** potential impacts on operations, classified as extreme when they could result in prolonged stoppages
- **Legal and regulatory impact:** any emerging regulations that could have a financial impact are classified as a strategic risk

Identified risks are plotted on a map that intersects the likelihood of occurrence and the potential impact if the risk materializes. Within this map, risks in the Major and Extreme impact categories with a Possible or Remote likelihood are prioritized for monitoring against Key Risk Indicators (KRI). Risks in these categories have established, appropriate control measures for both mitigation and monitoring. KRI implementation comprises the following stages:

- Defining indicators
- Mapping data
- Calculating indicators
- Setting tolerance levels
- Determining monitoring frequency
- Creating dashboards
- Reporting on results

An example of a KRI related to climate change would be GHG emissions from cast products compared to the annual target under the Company's 2030 ESG Strategy*. KRIs are tracked monthly for the emission sources most representative of the target.

Climate risks are classified as either physical or transition risks. Physical risks resulting from climate change can be event-driven (acute) or longer-term shifts (chronic) in climate patterns. For every identified risk, the Company determines the potential impact and mitigation actions, which are classified into time horizons ranging from short, medium and long term.

- **Short term with a horizon of zero to one year:** mitigation actions are included in the budget for the following year
- **Medium term with a horizon of one to five years:** aligns with the horizon of the Company's five-year Strategic Plan
- **Long term with a horizon of five to 30 years:** some long-term risk costs are provisioned in specific accounts

* Besides monitoring indicators directly linked to GHG emissions, CBA tracks transitional risks, such as reputational and technological risks. The Company's reputation is managed by the communication team and, in 2023, was assessed by RepTrak, a global consultancy specializing in corporate reputation intelligence. Meanwhile, the technology function keeps track of industry trends in the aluminum industry through the "Technological Radar," a tool designed to capture global innovations, including those geared to climate change mitigation.

Aluminum foil produced at the Alumínio plant (SP)



"Our risks are documented on cards, which contain important information about each risk. This detailed information includes the root cause of the risk, as we aim to address the source rather than just the consequence. We also **classify risks based on ESG criteria and identify risk factors** that may impact or be influenced by climate change."

Marcus Vinicius Lanzaletti
Risk Manager

Climate change risks and financial impacts

Transition risks:

Political and legal

Technological

Market

Reputational

Physical risks

Acute

Chronic



RISKS



Strategic risk management planning



Financial impact

Climate Risk Map



- 1 Lowering reservoir levels
- 2 Excessively high reservoir levels
- 3 Blackouts due to reduced streamflow
- 4 Impacts on containment structures from external events
- 5 Structural impacts from wind gusts
- 6 Loss of saplings for rehabilitation of mined land
- 7 Aquatic imbalance (death of fish and macrophytes)
- 8 Landslides (mine sites)
- 9 Landslides and/or slope erosion
- 10 System overloads (brownouts)
- 11 More frequent wildfires
- 12 Higher incidence of heat- and humidity-related transmissible diseases
- 13 Shortages of critical inputs
- 14 New taxes
- 15 Market-driven (LME) price fluctuation
- 16 New competitors
- 17 New entrants in the downstream market (Substitute materials)

○ Physical risks

● Transition risks

Note: CBA addresses risks classified as highly probable as emerging risks.

PHYSICAL RISKS

Risk 1

LOWERING RESERVOIR LEVELS



Climate aspect:

Reduced rainfall during dry seasons



Time horizon:

Short to long term



Operation affected:

Hydroelectric power plants, 22 in total (16 wholly owned and 6 jointly owned)



Geographies:

Operations in Goiás, Minas Gerais, Paraná, Santa Catarina and São Paulo



Magnitude of impact:

Major (Risk scale)



Potential impact:

- Reduced generation output
- Conflicts over water use



Likelihood:

Very likely



Potential financial impact (R\$):

as high as R\$ 140 million given the need to purchase electricity to make up for the shortfall



Risk management (mitigation and adaptation measures):

- Preventive maintenance plans for generation equipment
- Implementation of Operational Rules on storing water during the dry season and managing streamflow during the wet season
- Diversifying the energy mix
- Energy efficiency programs
- Implementing a Working Group and Working Plan on water resilience
- Protecting water bodies and headwaters

Risk 2

EXCESSIVELY HIGH RESERVOIR LEVELS



Climate aspect:

Extreme weather events



Time horizon:

Short term



Operation affected:

Hydroelectric power plants, 22 in total (16 wholly owned and 6 jointly owned)



Geographies:

Operations in Goiás, Minas Gerais, Paraná, Santa Catarina and São Paulo



Magnitude of impact:

Major (Risk scale)



Potential impact:

- Could trigger reservoir level alerts and adversely affect generation output
- Risks of flooding in downstream cities



Likelihood:

Marginally likely



Potential financial impact (R\$):

Not measured



Risk management (mitigation and adaptation measures):

- Emergency response plan
- Implementation of Operational Rules on storing water during the dry season and managing streamflow during the wet season
- Monitoring reservoir levels and indicators
- Membership of watershed committees

Risk 3

BLACKOUTS DUE TO REDUCED STREAMFLOW



Climate aspect:

Reduced rainfall during the dry season



Time horizon:

Long term



Operation affected:

Aluminum production facilities



Geographies:

Alumínio (SP), Araçariguama (SP), Nova Odessa (SP) and Itapissuma (PE)



Magnitude of impact:

Extreme (Risk scale)



Potential impact:

- Impacts on production, damage to water systems and adaptation costs
- Conflicts over water use (Society)



Likelihood:

Marginally likely



Potential financial impact (R\$):

Depending on the operation, the financial impact could potentially exceed R\$ 170 million as a result of stoppages lasting up to six months in the worst-case (albeit unlikely) scenario



Risk management (mitigation and adaptation measures):

- Implementing engineering projects to reduce water consumption
- Campaigns and training to reduce water withdrawals and consumption
- Implementing water resilience committees and working groups to monitor measures taken
- Periodically monitoring reservoir levels
- Initiatives to protect water bodies and headwaters
- Identifying new water sources (potential measure)
- Contingency plans outlining actions in response to water shortages

Risk 4

IMPACTS ON CONTAINMENT STRUCTURES FROM EXTERNAL EVENTS



Climate aspect:

Extreme weather events



Time horizon:

Long term



Operation affected:

Alumínio plant, hydro power plants and Miraí



Geographies:

Alumínio (SP), hydroelectric plants located in the states of Goiás, Minas Gerais, Paraná, Santa Catarina, São Paulo, and mines (MG)



Magnitude of impact:

Extreme (Risk scale)



Potential impact:

- Disruption of operations
- Environmental and social impacts on CBA premises and in surrounding areas
- Reputational damage



Likelihood:

Remote



Potential financial impact (R\$):

Not available. Considered extreme due to potential damage and insurance costs, although the likelihood is remote



Risk management (mitigation and adaptation measures):

- Projects to significantly reduce water content in residue impoundments
- Implementing dry disposal and mobile processing to eliminate the future need for tailings/residue dams
- Dam Management (SIGBAR), including monitoring and maintenance of containment structures

Risk 5

STRUCTURAL IMPACTS FROM WIND GUSTS



Climate aspect:

Wind



Time horizon:

Medium term



Operation affected:

Alux – Casting plant



Geographies:

Nova Odessa (SP)



Magnitude of impact:

Major (Risk scale)



Potential impact:

- Disruption of operations.
- Delayed deliveries
- Impacts on employee safety



Likelihood:

Marginally likely



Potential financial impact (R\$):

Representative costs have not been identified. Cost of repairing buildings and roofing, for example, would amount to approximately R\$ 500,000



Risk management (mitigation and adaptation measures):

- Periodic maintenance
- Emergency response plan
- Safety communications

Risk 6

LOSS OF SAPLINGS FOR REHABILITATION OF MINED LAND



Climate aspect:

Reduced rainfall during the dry season and extreme weather events



Time horizon:

Short and medium term



Operation affected:

Mines



Geographies:

Miraí, Itamarati and Poços de Caldas (MG)



Magnitude of impact:

Minor (Risk scale)



Potential impact:

Replanting costs, delayed handover of reclaimed land to land owners



Likelihood:

Probable



Potential financial impact (R\$):

Costs may vary depending on the tree species, reaching as high as R\$ 94,000



Risk management (mitigation and adaptation measures):

- Monitoring weather station data
- Planting management and maintenance
- Trials with different plant species and planting methods
- Collaboration with universities to improve planting practices
- Building temporary irrigation systems as necessary. Adjusting planting periods to reflect changes in rainfall patterns

Risk 7

AQUATIC IMBALANCE (DEATH OF FISH AND MACROPHYTES)

Climate aspect:
Warming

Likelihood:
Remote

Time horizon:
Medium and long term

Potential financial impact (R\$):
Not measured

Operation affected:
Hydroelectric power plants, 22 in total (16 wholly owned and 6 jointly owned)

Risk management (mitigation and adaptation measures):

- Monitoring water quality indicators and parameters in the reservoirs of all hydroelectric power plants within the Energy Business
- Biological monitoring of water bodies

Geographies:
Operations in Goiás, Minas Gerais, Paraná, Santa Catarina and São Paulo

Magnitude of impact:
Moderate (Risk scale)

Potential impact:

- Impacts on hydroelectric plant operation, reducing power output
- Potential effects on legal and regulatory requirements on water quality (IQA)

Risk 8

LANDSLIDES (MINE SITES)

Climate aspect:
Extreme weather events

Likelihood:
Remote

Time horizon:
Medium and long term

Potential financial impact (R\$):
Costs may vary depending on the tree species used to reclaim disturbed land, reaching as high as R\$ 350,000

Operation affected:
Mines

Geographies:
Miraf, Itamarati and Poços (Minas Gerais)

Magnitude of impact:
Moderate (Risk scale)

Potential impact:

- Remediation costs, delays in ore production
- Increased frequency of incidents
- Reputational damage

Risk management (mitigation and adaptation measures):

- Monitoring mine sites and assessing soil stability
- Reclaiming mine sites with species appropriate for soil stabilization (potential measure)
- Emergency response plan

Risk 9

LANDSLIDES AND/OR SLOPE EROSION

Climate aspect: Extreme weather events	Potential impact: Impact on dam service roads and reservoirs, leading to unscheduled reductions in power output
Time horizon: Short term	Likelihood: Remote
Operation affected: Hydroelectric power plants, 22 in total (16 wholly owned and 6 jointly owned)	Potential financial impact (R\$): Not measured
Geographies: Operations in Goiás, Minas Gerais, Paraná, Santa Catarina and São Paulo	Risk management (mitigation and adaptation measures): - Monitoring environmental and social indicators - Dam monitoring system
Magnitude of impact: Moderate (Risk scale)	

Risk 10

SYSTEM OVERLOADS (BROWNOUTS)

Climate aspect: Warming	Potential financial impact (R\$): Not measured due to complexity
Time horizon: Medium and long term	Risk management (mitigation and adaptation measures): - Preventive maintenance plans - Predictive equipment monitoring - Teams trained to respond to emergencies
Operation affected: Hydroelectric power plants	
Geographies: Operations in Goiás, Minas Gerais, Paraná, Santa Catarina and São Paulo	
Magnitude of impact: Minor (Risk scale)	
Potential impact: Operational stoppage (temporary) and impacts on structures and equipment	
Likelihood: Marginally likely	

Risk 11

MORE FREQUENT WILDFIRES



Climate aspect:

Reduced rainfall during the dry season



Time horizon:

Short and medium term



Operation affected:

All CBA operations



Geographies:

All CBA operations (GO, MG, PE and SP)



Magnitude of impact:

Moderate (Risk scale)



Potential impact:

- Higher expenses on fire response, and environmental, social and safety impacts.
- Higher insurance costs



Likelihood:

Probable



Potential financial impact (R\$):

The financial impact cannot be measured as incidents are nonrecurring



Risk management (mitigation and adaptation measures):

- Preventive work in collaboration with fire departments, and having fire response teams on call in each operation. In addition:
 - Implementation of fire breaks where required
 - Awareness raising and training to prevent fire outbreaks
 - Continuous improvement of fire response processes

Risk 12

HIGHER INCIDENCE OF HEAT- AND HUMIDITY-RELATED TRANSMISSIBLE DISEASES



Climate aspect:

Warming



Time horizon:

Long term



Operation affected:

All CBA operations



Geographies:

All CBA operations (GO, MG, PE and SP)



Magnitude of impact:

Minor (Risk scale)



Potential impact:

Higher incidence of heat-related and transmissible diseases



Likelihood:

Probable



Potential financial impact (R\$):

Not measured due to complexity. Impacts on absenteeism and health insurance claims



Risk management (mitigation and adaptation measures):

- Annual vaccination plan.
- Health and quality of life program in place
- Occupational health team trained and available on call in all operations.
- Monitoring health indicators
- Regular hydration and rest breaks for employees
- Health campaigns

Risk 13

SHORTAGES OF CRITICAL INPUTS

Climate aspect: Extreme weather events	• Disruption of operations • Delayed deliveries
Time horizon: Medium and long term	Likelihood: Marginally likely
Operation affected: Aluminum production facilities	Potential financial impact (R\$): Based on estimates, potential costs would be limited to R\$ 45 million
Geographies: Alumínio (SP), Araçariguama (SP), Nova Odessa (SP), Itapissuma (PE)	Risk management (mitigation and adaptation measures): • Expanding and geographically diversifying the Company's supplier base • Building stocks of critical inputs • Developing new suppliers
Magnitude of impact: Major (Risk scale)	
Potential impact: Some critical suppliers located in areas that could be affected by climate change might downscale their operations or, in the event of extreme weather events, have a reduced production capacity, affecting deliveries to CBA and resulting in disruptions in the Company's supply chain	

TRANSITION RISKS

Risk 14

NEW TAXES

Climate scenario: Carbon pricing and border taxes	
Time horizon: Short and medium term	
Operation affected: Aluminum production facilities	
Geographies: Alumínio (SP), Araçariguama (SP), Nova Odessa (SP), Itapissuma (SP)	
Magnitude of impact: Moderate (Risk scale)	
Potential impact: Higher operating costs	
Likelihood: Highly probable	
Potential financial impact (R\$): According to CBA's carbon pricing assessment, with the implementation of the Brazilian Greenhouse Gas Emissions Trading System (SBCE) and CBAM, the	

long-term financial impacts would amount to approximately R\$ 130 million, and short-term financial impacts would be approximately R\$ 50 million. These costs are likely to impact the entire industry depending on emissions performance. Learn more about carbon pricing on page 37

Risk management (mitigation and adaptation measures): • Monitoring the development of pricing mechanisms • Developing internal carbon pricing and applying it to strategic areas • Investing in projects and initiatives to reduce carbon emissions across each production stage • Measures to ensure readiness for regulatory developments • Implementing projects to reduce carbon emissions in operations

Risk 15

MARKET-DRIVEN (LME) PRICE FLUCTUATION



Climate scenario:

Aluminum price volatility due to climate change



Likelihood:

Probable



Potential financial impact (R\$):

Difficult to measure



Risk management (mitigation and adaptation measures):

- Commodities exposure map
- Financial risk map
- Assessments of financial impacts via projections
- Advertising CBA's low-carbon footprint (Alennium label) and robust climate agenda



Operation affected:

Aluminum Business



Geographies:

Alumínio (SP), Nova Odessa (SP), Araçariguama (SP) and Itapissuma (PE)



Magnitude of impact:

Major (Risk scale)



Potential impact:

Loss of profits and reputational damage associated with emissions performance in the production process

Risk 16

NEW COMPETITORS



Climate scenario:

Emerging low-carbon aluminum production technologies



Potential financial impact (R\$):

Highly complex to measure



Time horizon:

Medium and long term



Operation affected:

Aluminum Business



Geographies:

Alumínio (SP), Nova Odessa (SP), Araçariguama (SP) and Itapissuma (PE)



Magnitude of impact:

Moderate (Risk scale)



Potential impact:

Loss of competitiveness in the low-carbon market



Likelihood:

Probable



Risk management (mitigation and adaptation measures):

- Tracking technology trends (Technology Radar)
- Implementing innovation and digitalization strategies within the Company
- Collaborating on innovation, research and development with startups, universities and potential suppliers

Risk 17

NEW ENTRANTS IN THE DOWNSTREAM MARKET

-  **Climate scenario:**
Using secondary materials
-  **Time horizon:**
Medium and long term
-  **Operation affected:**
Aluminum Business (Downstream products)
-  **Geographies:**
Alumínio (SP) and Itapissuma (PE)
-  **Magnitude of impact:**
Moderate (Impact scale)
-  **Potential impact:**
Loss of market share
-  **Likelihood:**
Probable

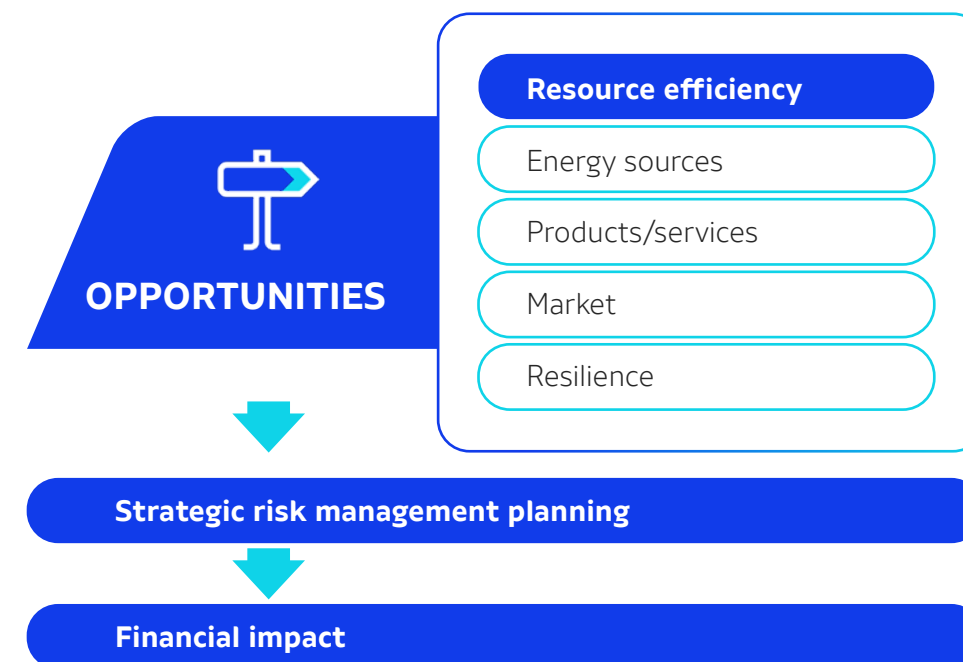
-  **Potential financial impact (R\$):**
Highly complex to measure
-  **Risk management (mitigation and adaptation measures):**
 - Mapping market trends
 - Working closely and co-creating with customers
 - Initiatives to further reduce the Company's carbon footprint
 - Strengthening the Company's reputation as a low-carbon aluminum producer, and advertising CBA's aluminum attributes

Note: the primary risks that could result in significant changes in the Company's financial statements are impact on structures, impacts on generation output and regulatory developments (CBAM and SBCE).

Opportunities

The imperative for climate change mitigation and adaptation could create opportunities to establish the Company as a leader for low-carbon aluminum production and climate resilience. Opportunities have been identified in the short, medium and long term across the Company's different divisions.

Types of climate-related opportunities



COMPETITIVENESS MANAGEMENT

Competitiveness Management (CM) is a management model aimed at accelerating value capture at CBA through a methodology focused on discipline, ultimately creating competitive advantages for the Company. This model encompasses various areas such as strategy, operations, innovation, personal development, and sustainability, linking projects sharing common business growth and evolution opportunities.

In 2023, a new sustainability module was incorporated into CBA’s Wave Program, a system used to monitor and approve initiatives. The new module is designed to optimize the Company’s approach to tracking sustainability and financial gains deriving from, for example, GHG emissions reductions (using CBA’s internal carbon price as a fixed price). Assessments are carried out whenever an initiative reaches a given maturity threshold, and all assessments are reviewed by the sustainability team to confirm whether there are sustainability gains.

Initiatives and indicators are systematically tracked throughout the project development and implementation process and following project completion. The platform also evaluates

the scale of initiatives to identify any significant financial or strategic impacts.

See below some of the outcomes from the Company’s climate-related Competitiveness Management initiatives since 2020:

	2020	2021	2022	2023
Climate change	• 279,489 tCO₂ in emissions reductions	• 108,932 tCO₂ in emissions reductions	• 27,339 tCO₂ in emissions reductions	• 110,621 tCO₂ in emissions reductions
Natural resources	• 3,000 MWh of electricity savings • 17,000 metric tons of savings on inputs and materials, including lime, caustic soda and steel bar • 359,000 m³ of savings on nitrogen	• 2,500 MWh of electricity savings • 944 metric tons of savings on materials such as fluoride, caustic soda and flocculants • 27,000 liters of savings on rolling oil.	• 52,000 m³ of water savings • 5,600 metric tons of savings on materials such as fluoride, caustic soda and flocculants • 300,000 liters of savings on rolling oil • 420,000 m³ of savings on natural gas	• 64,000 m³ of water savings • 3,400 metric tons of savings on caustic soda • More than 26,000 liters of savings on rolling oil • 709,000 m³ of savings on natural gas

Note 1: The reduction in greenhouse gas emissions excludes emissions avoided.

Note 2: The figures on sustainability gains are annual and not cumulative.



LEARN MORE IN THE 2023 ANNUAL REPORT

Learn more about sustainability impacts through Competitiveness Management on pages 44 and 45 of the [2023 CBA Annual Report](#).

TECHNOLOGY MANAGEMENT

Research & Development (R&D) plays a central role in CBA's strategy as a tool for achieving emissions reductions and improving efficiencies and financial performance. Discussions on R&D are led by the Technology team, which tracks climate-related trends and identifies opportunities such as emerging technologies and potential collaborations on carbon capture research.

This team also follows technology trends globally using a tool that applies a pre-established methodology to track global developments, events, scientific papers and patents.

CBA launches new carbon capture research in 2023

In 2023, CBA's Technology team took an important step in expanding its research on Carbon Capture, Utilization and Storage (CCUS). The Company launched research programs on the use of activated carbon and zeolites, as well as new product applications for captured CO₂. The Company also continued its research on the production of Tecno-solo from clay minerals generated in mining operations. These new additions to CBA's research pipeline underscore its commitment to environmental innovation and investing in technological development toward a low-carbon economy.



“We closely follow **emerging technology trends**, research and patents globally. We use a dedicated tool to search trade and science journals for topics of interest, including climate change, renewable energy and energy efficiency.”

Roberto Seno Júnior
Technology Manager

INNOVATION & DIGITAL OFFICE

CBA aspires to be recognized as an industry leader for Innovation and Digital, and has set measurable targets to this end. These targets cover aspects ranging from cultural transformation to capturing value creation opportunities. The Company's Innovation and Digital function is governed by four core beliefs. The second belief, and the one carrying the greatest weight, is product alignment with the Company's sustainability agenda.



LEARN MORE:

Read about CBA's digital strategy on page 34 of the [Annual Report](#).

Innovation Drivers at CBA

Focus

Value

Customer
perspective

Talents &
Culture

Ambidexterity

Future-ready strategic beliefs

Belief 1



The future of the aluminum industry will be data- and technology-driven

Belief 3



Science and material design play a critical role in accelerating potential applications for aluminum and new materials

Belief 2



Sustainability will be one of the main drivers of innovation in the industry

Belief 4



The aluminum industry will develop innovative new revenue streams

Innovation-related initiatives undergo a double assessment on ESG impacts, first qualitative and then quantitative. Following this assessment, initiatives are reviewed by the Innovation Committee, of which the Sustainability Manager is a standing member. One of the key ESG indicators monitored in the project cycle is impact on carbon emissions.

Since 2022, CBA has orchestrated DigitALL program activities through PODs: multidisciplinary teams devoted to addressing a specific problem within a given timeframe. The decision-making process to prioritize suggestions for implementation assesses six levers: alignment with strategy, economic value, ESG impact, scope, implementation timeline, and technological and competency maturity. Projects supporting the Company's ESG commitments are given greater importance in the POD scoping process. Additionally, when developing the business case for each POD, a comprehensive analysis is conducted to quantify and agree on metrics to track sustainability impacts, which are often directly related to the climate agenda.

OPPORTUNITY PIPELINE

In 2023, the Sustainability function organized a climate adaptation workshop that was attended by representatives from all operations, during which they developed a pipeline of climate opportunities. The goal in this exercise was to centralize identified initiatives using a standard approach to assess initiatives for feasibility and replicability to other operations or businesses.

Climate opportunities may involve mitigation projects providing financial benefits, such as higher margins on low-carbon products, or the development of the wider supply chain.



CBA's Digital & Innovation team

CBA's climate opportunity pipeline
centralizes identified initiatives
using a standardized approach to
assess feasibility for implementation.

Opportunity	Category	Background	Scope (operation)
 Access to new markets	Markets	Increased demand for low-carbon aluminum. There are opportunities to expand CBA's product portfolio into new markets (new customers seeking to decarbonize their supply chains and high-growth industries linked to the energy transition, such as renewable energy or the automotive sector)	Aluminum Business
 Carbon credits - Projects	Products/services	Develop new projects to generate carbon credits and emissions offsets	Corporate
 Co-creation with customers	Products/services	Develop new products, solutions and applications for aluminum in collaboration with customers, with a focus on decarbonization	Aluminum Business
 ReAl Project	Resource efficiency / energy sources	This project enables flexible and carton packaging containing aluminum to be recycled, in a process that also generates green hydrogen that can be used in replacement of other fuels. Learn more about the project in CBA's 2023 Annual Report	Aluminum
 Higher scrap content	Products and services	Initiatives to increase recycled content as well as production capacity, while reducing products' carbon footprint	Aluminum Business
 Oxy-combustion system	Energy efficiency	Melting furnace retrofits to consume more oxygen, optimizing the combustion process and minimizing carbon emissions. The current system uses 70% natural gas and 30% air. The retrofitted system will use 70% oxygen and 30% natural gas. The project will also deliver productivity improvements	Alux (already implemented), with the potential to be replicated in other casting facilities



Low-carbon aluminum

Marco Tardelli Silva Damasceno, production
engineer, Alumínio plant (SP)

Metrics

The Company tracks a set of metrics related to emissions, energy, water and land use.

EMISSIONS INVENTORIES

CBA develops greenhouse gas emissions inventories in accordance with guidelines provided by the GHG Protocol. In 2023, the Company used an automated tool for the first time to compile its GHG inventory. This tool is also compliant with the GHG Protocol and uses emissions factors adopted by the Brazilian chapter of the program. The inventory uses the operational control approach, covering all greenhouse gases (CO₂, CH₄, N₂O, HFCs, PFCs, SF₆ and NF₃).

Scope 1 and 2 emissions are compiled from primary data from operations, including the Market-Based calculation for Scope 2. For Scope 3, category 4, 6 and 9 emissions are compiled using the Brazil GHG Protocol Program tool and primary data from operations. For categories 1, 3 and 10, the emissions factors used are derived from the Ecoinvent, DEFRA and CRU (a global financial

consulting firm that also tracks the emissions of aluminum producers globally) databases. Category 10 is estimated based on product sales volumes during the current year, while other inputs are also based on primary data from operations. The scope 3 categories that are tracked annually have been defined in line with an IAI assessment.

Annually, emissions are assured by an Independent Verification Organization accredited by INMETRO to provide limited assurance of greenhouse gas emissions inventories ([see the Appendix](#)).

Scope 2

- **Location-based approach:** data are confined to geographic boundaries and a given period, assuming all energy is derived from the national grid. Location-based reporting is mandatory

- **Market-based approach:** based on an emission factor directly related to the source of the electricity, which must be evidenced and traceable. Market-based reporting is optional

CBA reports data using both approaches, but believes that the market-based approach is better suited to the Company as a producer of clean energy and because it purchases Renewable Energy Certificates (RECs) that ensure all its energy sources are traceable. As a result, the Company’s scope 2 emissions are extremely low, and limited only to emissions from biomass-fired steam boilers.

Business unit	Emissions in 2023 (thousand tCO ₂ e)
Aluminum	1,365.3
Energy	4.7

Note: includes scope 1 and 2 emissions

Emissions breakdown - thousand metric tons of CO₂e (2020 - 2023)

Direct (Scope 1) emissions

Category	2020		2021		2022		2023	
	tCO ₂ e	% of scope	tCO ₂ e	% of scope	tCO ₂ e	% of scope	tCO ₂ e	% of scope
Stationary combustion	284.7	27%	258.4	22%	283.7	21%	271.4	20%
Mobile combustion	15.3	1%	17.3	2%	20.4	2%	18.3	1%
Fugitive emissions	4.2	0%	4.7	0%	5.5	0%	5.9	1%
Industrial processes	759.6	71%	872.1	76%	1,046.2	77%	1,058.1	78%
Agricultural activities	0.1	0%	0.1	0%	0.1	0%	0.2	0%
Land-use change	N/A	N/A	N/A	N/A	1.4	0%	4.4	0%
Waste (solid waste + effluents)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total emissions	1,063.9		1,152.6		1,357.3		1,358.3	

Biogenic emissions - Scope 1

Biogenic CO ₂ e emissions	2.3	N/A	2.7	N/A	2.9	N/A	8.4	N/A
Biogenic CO ₂ e removals	11.9	N/A	4.2	N/A	1.5	N/A	0.5	N/A

N/A - not applicable

Indirect (Scope 2) emissions – location-based approach

Category	2020		2021		2022		2023	
	tCO ₂ e	% of scope	tCO ₂ e	% of scope	tCO ₂ e	% of scope	tCO ₂ e	% of scope
Electric energy	333.4	97%	774.4	97%	264.2	95%	235.0	94%
Transmission and distribution losses	7.1	2%	18.2	2%	6.9	3%	7.1	3%
Purchased heating	5.2	1%	7.0	1%	6.8	2%	7.1	3%
Total emissions	345.6		799.5		277.9		249.2	

Indirect (Scope 2) emissions – market-based approach

Category	2020		2021		2022		2023	
	tCO ₂ e	% of scope	tCO ₂ e	% of scope	tCO ₂ e	% of scope	tCO ₂ e	% of scope
Electric energy	66.0	91%	0	0%	0	0%	0.0	0%
Transmission and distribution losses	1.3	2%	0	0%	0	0%	0.0	0%
Purchased heating	5.1	7%	7	100%	6.8	100%	7.1	100%
Total emissions	72.40		7.00		6.8		7.1	

Biogenic emissions (Scope 2)

Biogenic CO ₂ e emissions	266.2	N/A	369.5	N/A	397.8	N/A	416.3	N/A
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N/A – not applicable

Other indirect (Scope 3) emissions

Category	2020		2021		2022		2023	
	tCO ₂ e	% of scope	tCO ₂ e	% of scope	tCO ₂ e	% of scope	tCO ₂ e	% of scope
Category 1 – Goods and services purchased	1,400.2	94%	2,052.2	85%	971.3	72%	917.1	68%
Category 3 – Fuel- and energy-related activities not included in Scope 1 or Scope 2	67.6	5%	36.9	2%	51.1	4%	48.5	4%
Category 4 – Transportation and distribution (upstream)	22.2	1%	79.7	3%	93.7	7%	144.2	11%
Category 6 – Business travel	N/A	N/A	0.1	0%	0.4	0%	0.4	0%
Category 9 – Transportation and distribution (downstream)	N/A	N/A	31.6	1%	42.0	3%	34.2	3%
Category 10 – Reprocessing of sold products	N/A	N/A	208.2	9%	191.1	14%	194.1	15%
Total emissions	1,490.0		2,408.7		1,349.6		1,338.5	

Biogenic emissions (Scope 3)

Biogenic CO ₂ e emissions	2.6	N/A	11.5	N/A	12.8	N/A	18.8	N/A
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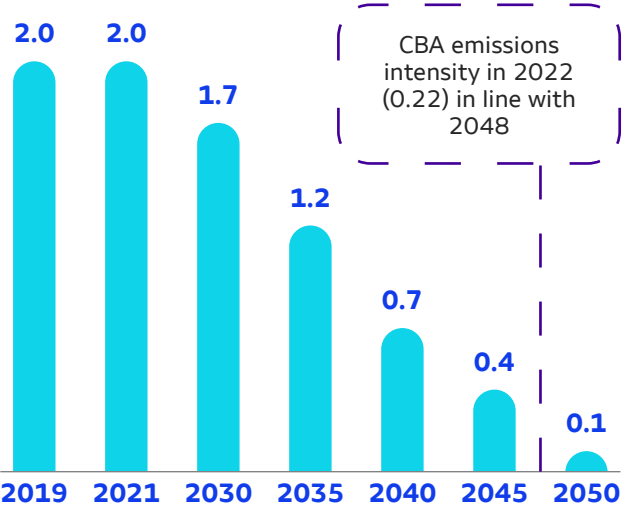
N/A – not applicable.

Note: Categories 6, 9, and 10 began to be monitored periodically starting in 2021.

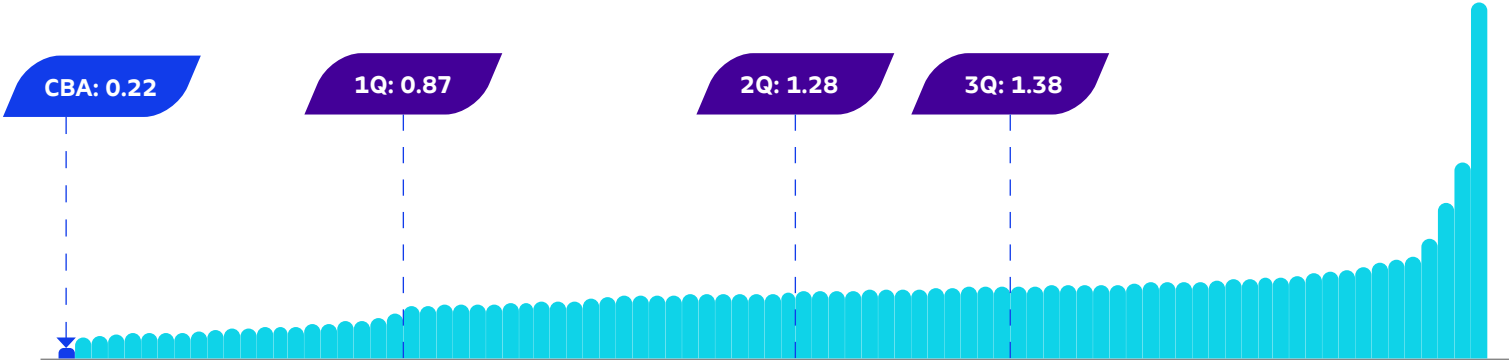
GHG emission intensity

The Company also calculates emission intensity expressed as tCO₂ per unit of production. One of the Company’s best-performing operations in emissions intensity is the Refinery, which boasts the lowest carbon emissions in the world—lower than all other companies in the first quartile according to data from consulting firm CRU.

IAI decarbonization roadmap for alumina refineries intensity - 1.5°C scenario (tCO₂e/t oxide)



Refinery emissions intensity - 2022



Note: Refinery emissions intensity across scopes 1 and 2 (tCO₂e/t oxide). Source: CRU

	2021	2022	2023
Mines	0.008 tCO ₂ e/t bauxite	0.009 tCO ₂ e/t bauxite	0.009 tCO ₂ e/t bauxite
Refinery	0.20 tCO ₂ e/t alumina	0.24 tCO ₂ e/t alumina	0.22 tCO ₂ e/t alumina
Smelters	2.56 tCO ₂ e/t molten al	3.03 tCO ₂ e/t molten al	3.23 tCO ₂ e/t molten al
Casting	0.13 tCO ₂ e/t cast al	0.13 tCO ₂ e/t cast al	0.13 tCO ₂ e/t cast al
Downstream	0.11 tCO ₂ e/t semi-fabricated al	0.11 tCO ₂ e/t semi-fabricated al	0.11 tCO ₂ e/t semi-fabricated al
Metalex	0.26 tCO ₂ e/t cast al	0.25 tCO ₂ e/t cast al	0.28 tCO ₂ e/t cast al
Itapissuma	0.96 tCO ₂ e/t semi-fabricated al	0.91 tCO ₂ e/t semi-fabricated al	0.93 tCO ₂ e/t semi-fabricated al
Alux	N/Av	0.31 tCO ₂ e/t cast al	0.27 tCO ₂ e/t cast al

N/Av – not available.

Note: Alux was acquired in 2022, and therefore data for 2021 is not available

In addition to disclosures by business division, CBA also tracks indicators relating to products from the Alumínio plant (SP), covering all stages of the value chain (Mining, Refinery, Smelting, Casting, Downstream and Supporting Areas) and Scope 1 and 2 emissions:

Emissions indicators by product:

Alumínio plant – Primary aluminum (including all stages from mining to smelting, where liquid aluminum is produced):

- **Primary aluminum (Scopes 1 and 2):** 3.88 tCO₂e/t
- **Primary aluminum (Scopes 1, 2 and 3 – Categories 1, 3 and 4):** 5.06 tCO₂e/t

Alumínio plant – Casting (including scope 1 and 2 emissions across all stages of the aluminum value chain (Mining, Refinery, Smelting, Casting, and Supporting Areas):

- **Ingots:** 3.50 tCO₂e/t
- **Billets:** 2.89 tCO₂e/t
- **Caster:** 3.15 tCO₂e/t
- **Slabs:** 2.42 tCO₂e/t
- **Rod:** 4.31 tCO₂e/t

Alumínio plant – Downstream (including scope 1 and 2 emissions across all stages of the aluminum value chain (Mining, Refinery, Smelting, Casting, Downstream and Supporting Areas):

- **Extruded profiles:** 3.99 tCO₂e/t
- **CC sheet:** 4.29 tCO₂e/t
- **DC sheet:** 3.96 tCO₂e/t
- **Medium sheet:** 4.19 tCO₂e/t
- **Foil:** 4.87 tCO₂e/t

Itapissuma rolling mill (including scope 1 and scope 2 emissions generally and scope 3 emissions in the aluminum value chain*):

- **Sheet:** 5.66 tCO₂e/t
- **Foil:** 4.17 tCO₂e/t

Metalex (including scope 1 and scope 2 emissions generally and scope 3 emissions in the aluminum value chain*):

- **Billets:** 2.28 tCO₂e/t

Alux (including scope 1 and scope 2 emissions generally and scope 3 emissions in the aluminum value chain*):

- **Ingots:** 0.31 tCO₂e/t

Casting facility, Alumínio plant (SP)

* Scope 3, including only Category 1 – Purchased goods (aluminum ingots).

Targets

CBA has set climate targets aligned with its 2030 ESG Strategy and approved by the Science Based Targets initiative (SBTi), an organization that promotes science-based climate targets in line with the Paris Agreement. This report addresses 2030 ESG Strategy targets that are associated with emissions reductions and other targets supporting the climate agenda.

DECARBONIZATION TARGETS

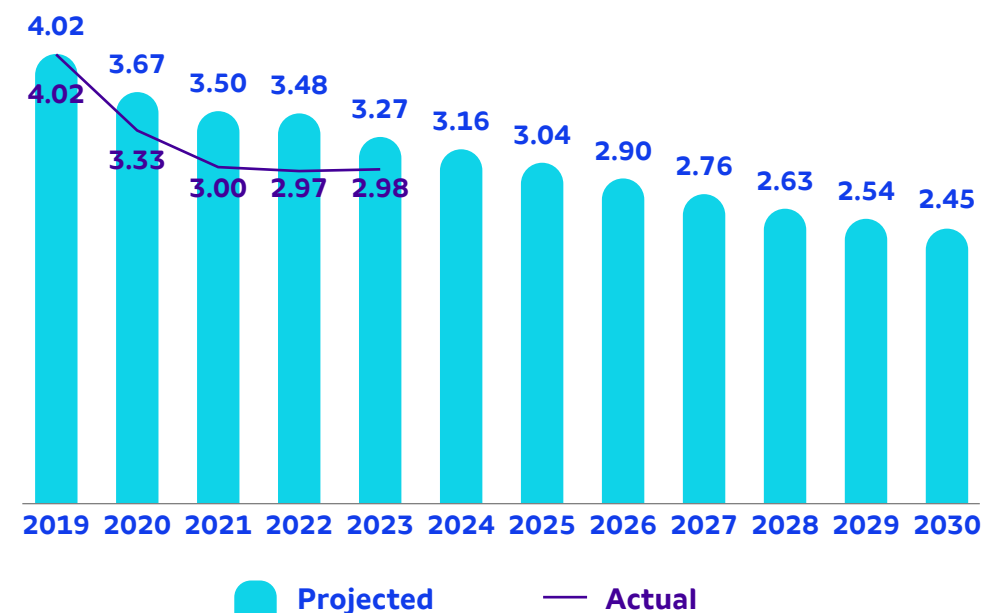


Reduce emissions by
40% (on average for cast
products, cradle-to-gate)

- **Type:** Intensity target
- **Baseline:** 2019
- **Timeframe:** 2030

- **Scope:** Includes scope 1 and scope 2 emissions across Mining, Refinery, Smelting, Casting and Supporting operations, as well as category 1 scope 3 emissions (purchased aluminum ingots)
- **Operations:** Alumínio (SP), Alux (SP), Metalex (SP) and Mining operations (Miraí, Itamarati de Minas and Poços de Caldas, in Minas Gerais)
- **Initiatives to meet target:** A biomass boiler project has been completed and the Company sources 100% of its electricity requirement from renewable sources. CBA has ongoing projects to upgrade its Smelters and increase scrap consumption in the production process
- **2023 results:** 26% reduction since 2019, outperforming projections for the period. There was a slight increase compared to 2022 due to temporary smelter instability issues caused by substandard raw materials for producing anodes

Estimated primary emissions (tCO₂e/t cast products)





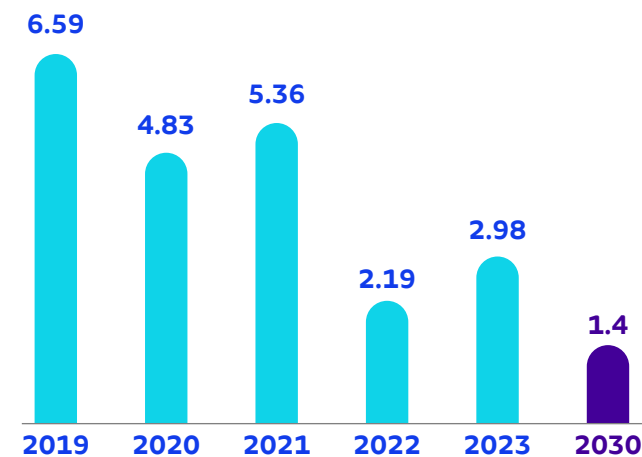
Billets at Metalex (SP), a recycling facility producing Downstream products



100% of billets produced at Metalex with greenhouse gas emissions lower than 1.4 tCO₂/t

- **Type:** Intensity target
- **Baseline:** 2019
- **Timeframe:** 2030
- **Scope:** Includes scope 1, scope 2 and scope 3 emissions (purchased ingots – category 1)
- **Operations:** Metalex (SP)
- **Initiatives to meet target:** Increased scrap consumption in the production process, installation of a Sidewell furnace and scrap treatment line, and continued use of 100% renewable electricity
- **2023 results:** 2.28 tCO₂e/t billets. In relation to 2022, there was a slight increase due to the need to import ingots to meet demand

Metalex emissions per product
(tCO₂e/t billets)





SCIENCE
BASED
TARGETS

SBTI-APPROVED GHG REDUCTION TARGETS:

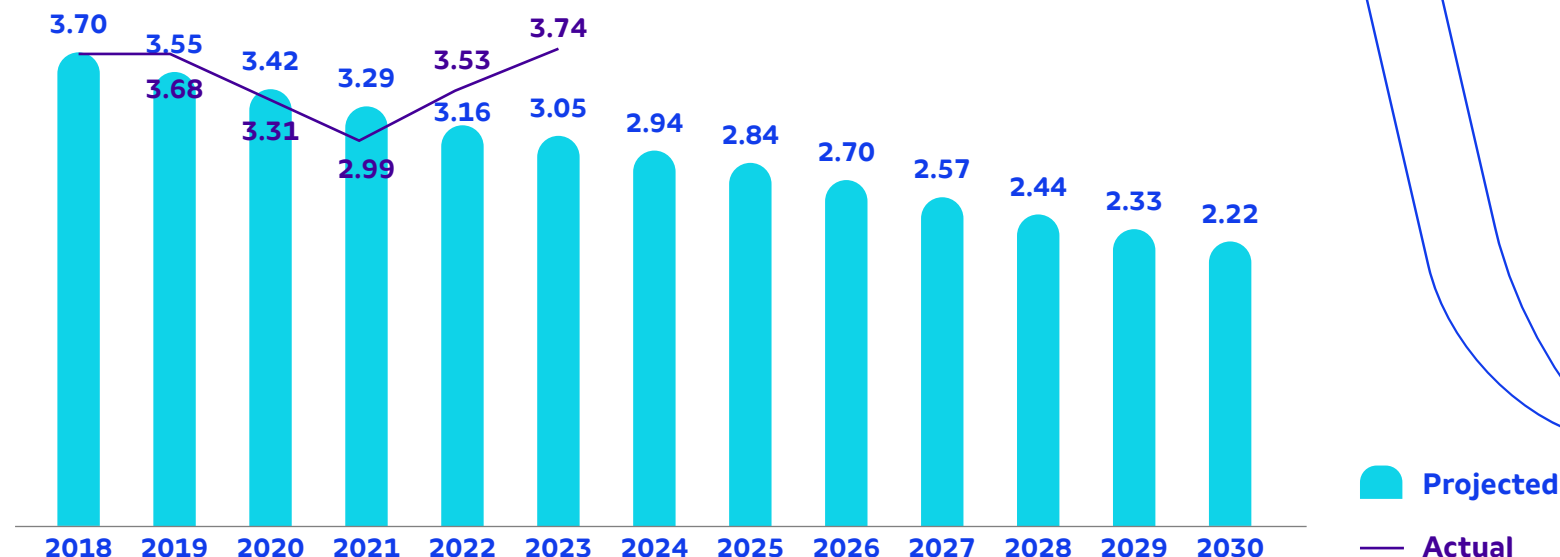
CBA was the first primary aluminum producer in the world to have targets approved by SBTi. The targets were set in 2021 and aligned with the Sectoral Decarbonization Approach (SDA) 2°C scenario (an ambition established by SBTi for aluminum companies).



Reduce emissions intensity (scopes 1 and 2) by 40% in aluminum production

- **Type:** Intensity target
- **Baseline:** 2018
- **Timeframe:** 2030
- **Scope:** Includes scope 1 and scope 2 Refinery and Smelting emissions
- **Operations:** Alumínio plant (SP)

SDA emissions reduction trajectory (tCO₂e/t liquid aluminum)



- **Initiatives to meet target:** Installation of a biomass boiler (completed), Smelter upgrade and 100% renewable electricity
- **2023 results:** 0% reduction since 2018. At yearend 2022 and in the first quarter of 2023,, CBA was faced with operational issues at its Smelters. The Company identified alterations in the physical and chemical properties of third party-supplied petroleum coke and coal-tar pitch, the

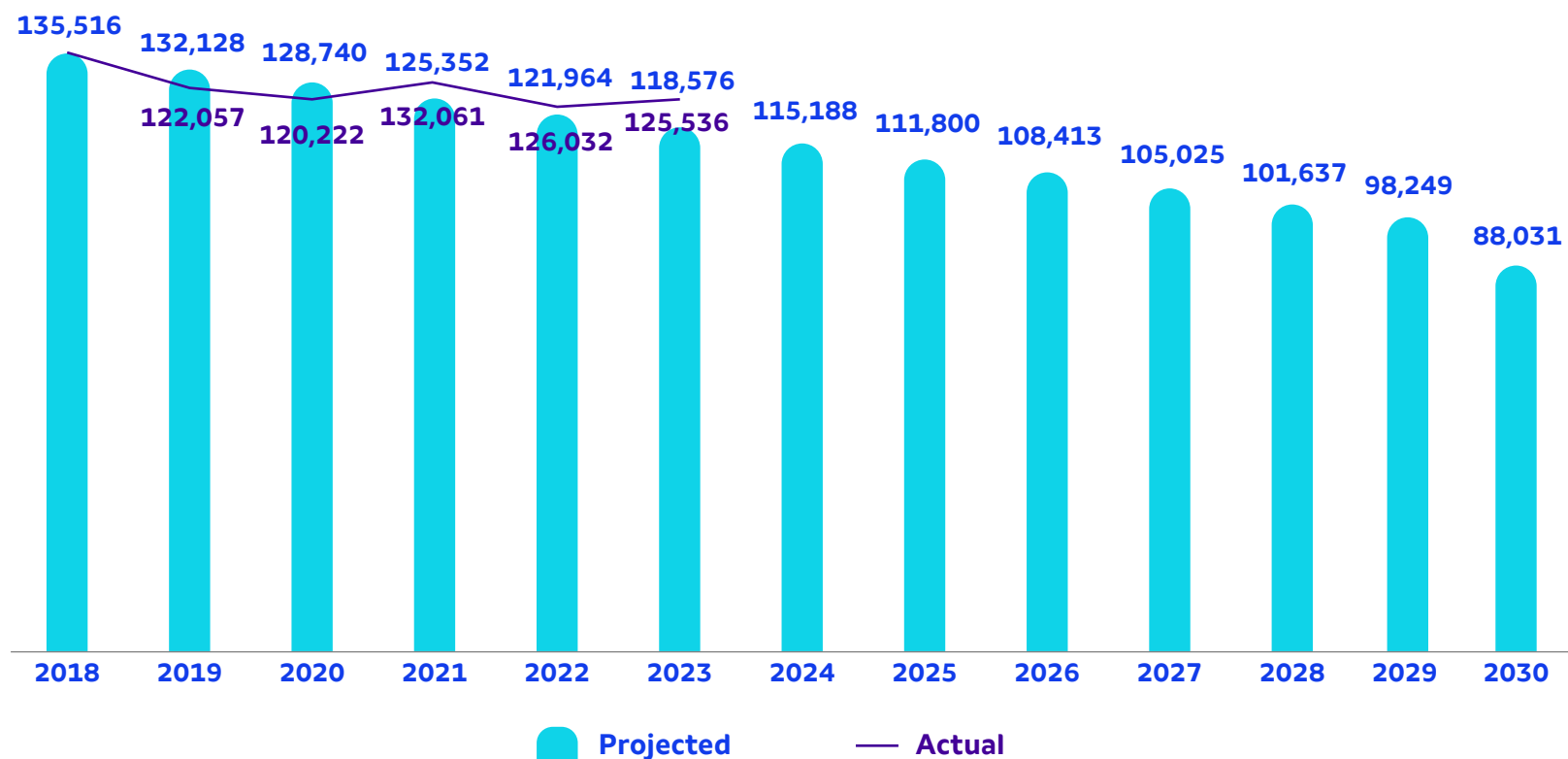
primary constituents of the anode paste used in this production stage. These alterations led to inconsistent quality. To resolve this issue, the Company began importing coke and coal-tar pitch to formulate a new blend of anode paste developed in-house at CBA. After adapting the process to the new material to meet the Company's stringent quality requirements, operations were stabilized, with production volumes rebounding



Reduce absolute scope 1 and 2 emissions from other operations by 35%

- **Type:** Absolute target
- **Baseline:** 2018
- **Timeframe:** 2030
- **Scope:** Includes scope 1 and scope 2 emissions from Mining, Casting and Downstream operations
- **Operations:** Mines (Miraí, Itamarati de Minas and Poços de Caldas – MG), Itapissuma facility (PE), Metalex (SP) and Alumínio plant (SP)
- **Initiatives to meet target:** Improvements in operating performance, energy efficiency and continued use of 100% renewable electricity
- **2023 results:** 7.4% reduction since 2018

Emissions reduction trajectory for other stages (tCO₂e)

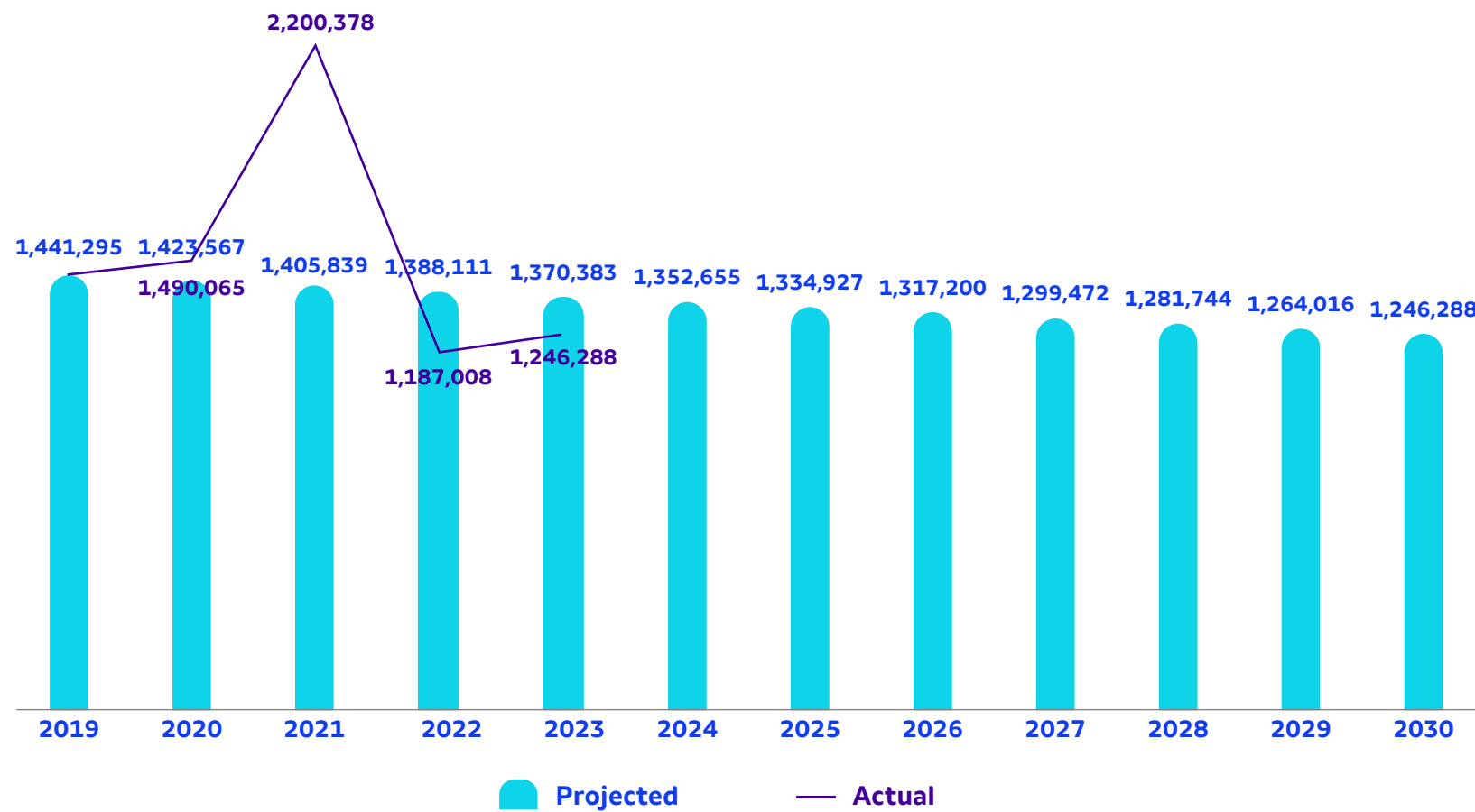




Reduce scope 3 emissions
(categories 1, 3, 4 and 9) by 13.5%
across all business units

- **Type:** Absolute target
- **Baseline:** 2019
- **Timeframe:** 2030
- **Scope:** Includes scope 3 emissions across category 1 (consumer goods), 3 (fuel- and energy-related activities), 4 (upstream transportation) and 9 (downstream transportation)
- **Operations:** Aluminum Business operations
- **Initiatives to meet target:** Sourcing inputs, services and logistics from suppliers with a lower carbon footprint and engaging the value chain (suppliers)
- **2023 results:** 20.6% reduction since 2019

Emissions reduction trajectory for the supply chain (tCO₂e)



NET ZERO:



Create a roadmap to becoming emissions neutral by 2050

- **Type:** Absolute target
- **Baseline:** 2019
- **Timeframe:** 2050
- **Scope:** Includes scope 1 and 2 emissions
- **Operations:** Aluminum Business units
- **Initiatives to meet target:** Implement planned mitigation initiatives. This target relies on technological upgrades, some of which are currently being assessed. Other initiatives include offsetting residual emissions (limited to 9% as recommended by the SBTi for the aluminum sector); the Company has already invested in two projects generating carbon credits (REDD+ *Cerrado* and *Reflora*)

- **2023 results:** CBA has made progress in reducing emissions intensity, but due to the higher production output in the year, absolute emissions increased



Implemented



Under implementation



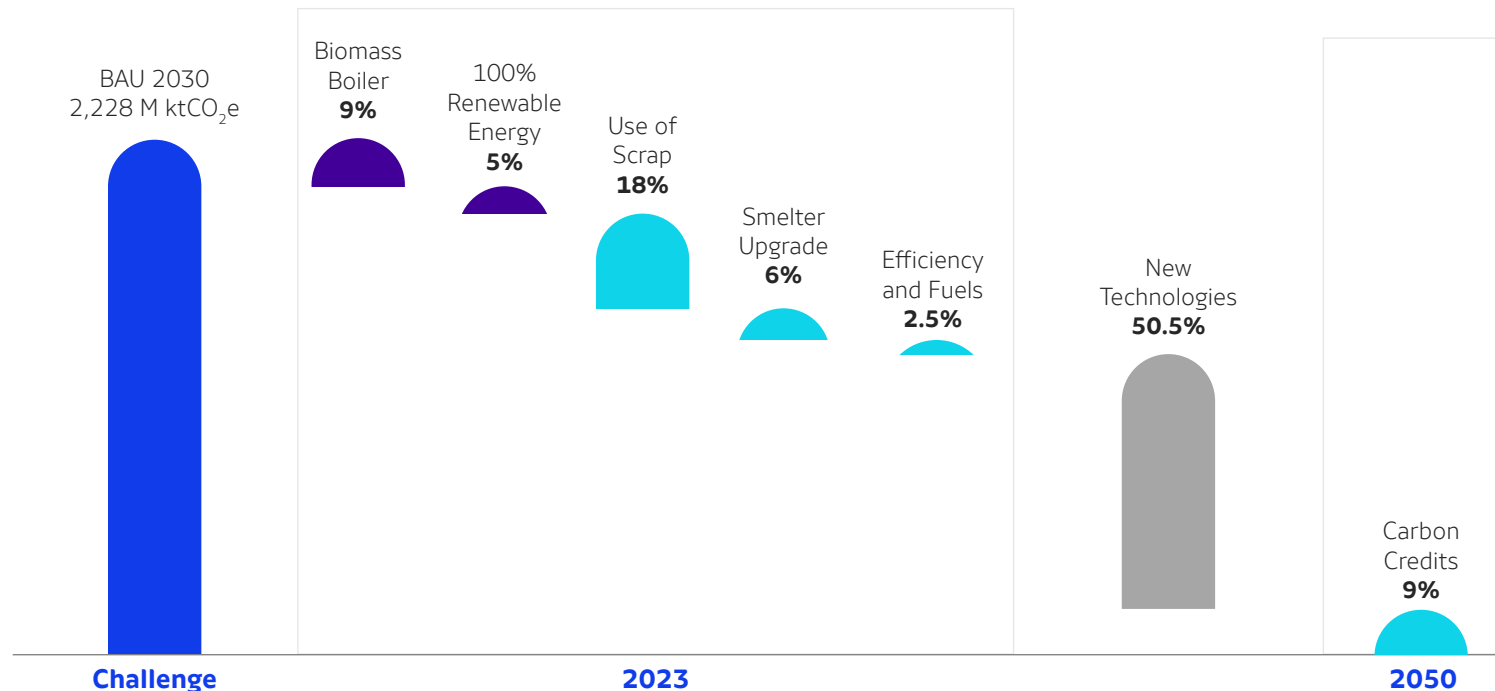
Under study

Net zero roadmap

Planned mitigations

Potential studies

Neutralization



CBA projects supporting the climate agenda

CBA has implemented significant projects to reduce greenhouse gas (GHG) emissions and generate carbon credits, including the following:



A biomass boiler
at Alumínio (SP)

Biomass boiler

In 2020, the Company began using steam from a boiler fueled by biomass in replacement of natural gas and fuel oil at the Alumina Refinery. As a result, the Refinery now boasts the lowest carbon emissions in the world, as reported by CRU's emissions tool, with emissions from this stage reduced by over 60%.

Smelter upgrade

An ongoing Smelter upgrade will improve process efficiency and safety while reducing GHG emissions (by approximately 20%) through an automated spot alumina feed system. The pilot phase of this project began in 2018, and currently, 150 pots in one of CBA's six pot rooms have been upgraded. Plans are underway to gradually roll out this upgrade to all other pot rooms in the coming years.



Pot Room III,
Alumínio (SP)

Increased use of scrap

Replacing primary aluminum with scrap bypasses emissions-intensive production stages. The Company has implemented a number of related initiatives, including the acquisition of Alux do Brasil, installation of Sidewell furnaces at Metalex, construction of a scrap treatment line, and the establishment of a new Processing & Recycling Center. Over the following years, the billet production line at Alumínio will also be upgraded to increase recycling rates.



Alux do Brasil,
Nova Odessa (SP)



An ingot produced at the
Alumínio plant (SP)

Ingot traceability

CBA has set a target to decarbonize the aluminum scrap and ingots sourced externally to 4 tCO₂e/t aluminum by 2030, supporting emissions reductions at non-vertically integrated plants.



Planting seedlings as part of the *Reflora* program

Reflora

This program will re-forest disturbed land on smallholder properties, including legal reserves or protected areas. *Reflora* is focused on rehabilitating ecosystems and increasing local biodiversity by offering support to land owners in achieving compliance with the Brazilian Forest Code. The program also has the potential to issue reforestation-based carbon credits. In 2023, after identifying and profiling landowners registered in the previous year, program teams conducted site visits for final verification and contract signing. A total of 200 hectares have been selected for rehabilitation in the states of Minas Gerais, Goiás, and São Paulo. Planting activities should begin in 2024. The Company anticipates that, in the medium to long term, these restored areas will serve as providers of ecosystem services, such as climate regulation, increased spring flow, protection of local biodiversity, formation of wildlife corridors, and carbon sequestration.

REDD+ Cerrado program

This is the first Reducing Emissions from Deforestation and Forest Degradation (REDD+) program in Brazil's *Cerrado* biome. This program covers an area of 11,500 hectares on the *Legado Verdes do Cerrado* reserve, with 374,800 metric tons of carbon already certified for the period 2017–2023. The program is anticipated to generate 1.7 million carbon credits over the space of 30 years. The *Legado Verdes do Cerrado* credits are audited and have been registered with the Verra* registry. They are also certified to the Social Carbon standard, attesting that the reserve's nature conservation activities provide adjacent social benefits. The proceeds from the sale of these credits will be used toward expanding initiatives including research, biodiversity conservation, training, forest fire response, and new-economy incentive programs.



Legado Verdes do Cerrado (GO)



A nursery at *Legado Verdes do Cerrado* – a CBA-managed nature reserve in Goiás (GO)

OTHER CLIMATE-RELATED TARGETS



Offer customers a carbon-neutral product range

- **Type:** Qualitative
- **Baseline:** 2019
- **Timeframe:** 2030
- **Scope:** CBA products
- **Operations:** Aluminum Business operations
- **Initiatives to meet target:** Reduce the carbon footprint of CBA products and generate carbon credits to offset product-related emissions
- **2023 results:** 374,800 metric tons of carbon credits issued for the period from 2017 to 2023



Develop a climate change adaptation plan

- **Type:** Qualitative
- **Baseline:** 2019
- **Timeframe:** 2030
- **Scope:** Aluminum and Energy Business
- **Operations:** All operations
- **Initiatives to meet target:** Identifying and validating climate adaptation initiatives, developing climate projections to support internal decision-making (climate change resilience), and engaging the supply chain in the Company's areas of influence
- **2023 results:** Developed a pipeline of climate-related opportunities; updated climate adaptation studies covering all operations; updated climate risks; engaged suppliers around climate change; and identified climate-related risks and developed climate projections for priority suppliers



**Public Management Support
in mitigating and adapting to
climate change**

- **Type:** Qualitative
- **Baseline:** 2022
- **Timeframe:** 2030
- **Scope:** Municipalities where the company has operations that have the most significant gaps in climate management capabilities
- **Operations:** Not applicable
- **Initiatives to meet target:** Create a methodology and tools to support municipal governments in strengthening their institutional capabilities to manage climate risks and build climate resilience, taking account of each municipality's specific needs. Develop methods to assess municipal climate management maturity (for assessments and monitoring) and implement a Public Management Support Program in priority municipalities where the Company operates

- **2023 results:** Launched a Climate Action initiative, which included the development of a Climate Vulnerability Index, a Climate Adaptation Checklist and a Public Management Support program (learn more on page 26). Planned two municipal pilots to trial the AGP methodology in 2024



LEARN MORE

Learn more about the Public Management Support initiative on page 108 of the [CBA Annual Report](#).



Legado Verdes do Cerrado, a CBA-managed nature reserve in Goiás (GO)



Source 100% of plants' power requirement from renewable sources

- **Type:** Absolute target
- **Baseline:** 2019
- **Timeframe:** 2030
- **Scope:** Aluminum and Energy Business (includes electricity consumption in all operations)
- **Operations:** All
- **Initiatives to meet target:** Captive power generation capacity with a diversified portfolio, and purchasing Renewable Energy Certificates (REC) where necessary
- **2023 results:** Target met and maintained since 2021, with the Company consuming 100% renewable and traceable electricity

Renewable energy sources



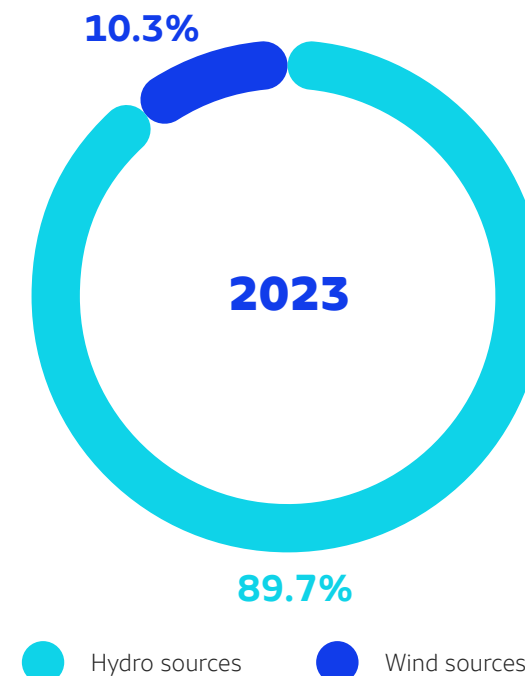
Note: CBA's renewable generation capacity exceeds the capacity stated in traceability documents. This reflects strategic decisions to enable the sale of carbon credits for some power plants and wind farms.



Diversify renewables capacity beyond hydro

- **Type:** Absolute target
- **Baseline:** 2022
- **Timeframe:** 2030
- **Scope:** Energy Business
- **Operations:** Power plants
- **Initiatives to meet target:** Conduct studies and prospect for new sources of electricity supply to diversify CBA's electricity mix. Commission new wind complexes
- **2023 results:** 89.7% of capacity from hydro sources and 10.3% from wind sources

2023 results



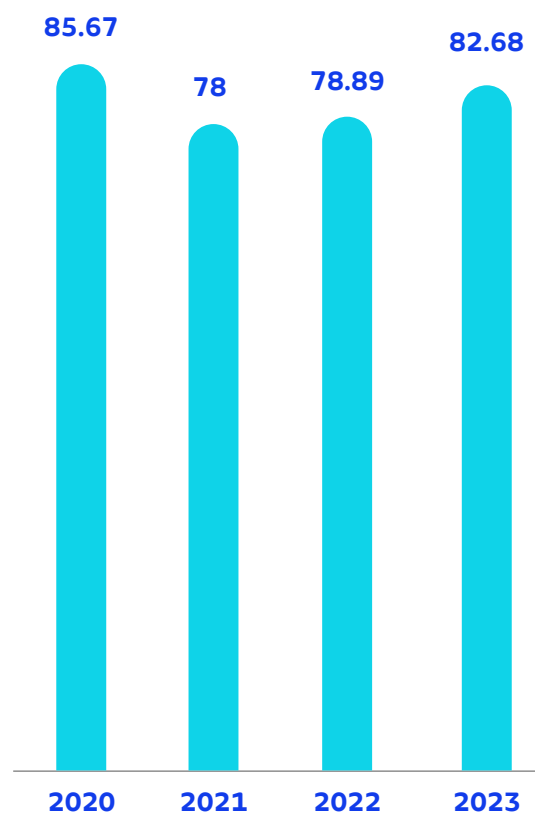


Reduce energy intensity (electric power and fuels)

- **Type:** Absolute target
- **Baseline:** 2019
- **Timeframe:** 2030
- **Scope:** Includes electricity and fuel consumption
- **Operations:** All
- **Initiatives to meet target:**
Implemented three energy efficiency projects at the Alumínio plant, providing potential electricity savings of 5 MW in the production process
- **2023 results:** 82,68 GJ/t finished product

Note: the figure worsened in 2023 due to the restart of Pot room 3 (half the pot room)

Energy intensity (GJ/t finished product)



Note: The data refer to finished products from the Alumínio plant (SP)



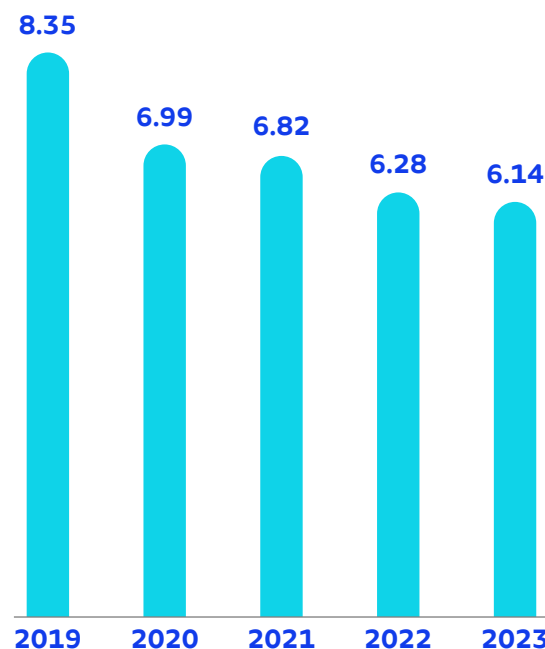
Cintia Ribeiro da Silva Barros -
a lathe operator at the Sorocaba facility (SP)



**Reduce water withdrawals
per metric ton of molten
aluminum by 20%**

- **Type:** Intensity target
- **Baseline:** 2019
- **Timeframe:** 2030
- **Scope:** Includes water withdrawals in the liquid aluminum production process
- **Operations:** Alumínio plant (SP)
- **Initiatives to meet target:** Closed-circuit projects, Smelter upgrade, and water recovery from the Palmital (SP) dam via the Filter Press project
- **2023 results:** 26.5% reduction in water intensity

Water intensity
(m³/t liquid aluminum)



**Implement water stewardship
initiatives to improve water security
in partnership with stakeholders**

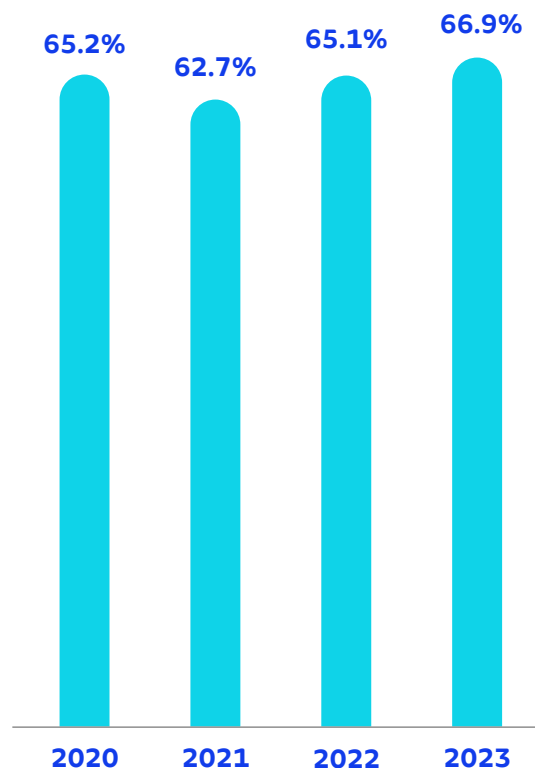
- **Type:** Qualitative
- **Baseline:** 2022
- **Timeframe:** 2030
- **Scope:** Corporate
- **Operations:** All operations
- **Initiatives to meet target:** Membership of watershed committees; newly created Water Resilience Committee to discuss and propose measures; and responses to the CDP Water Security questionnaire
- **2023 results:** Reformulated Water Resilience Working Group into a Water Resilience Committee; scored B on CDP Water Security questionnaire for the second consecutive year



Increase the ratio of aluminum recycled from industrial and end-of-life scrap at Metalex to 80%

- **Type:** Absolute target
- **Baseline:** 2019
- **Timeframe:** 2030
- **Scope:** Internal and external scrap consumption for billet production
- **Operations:** Metalex (SP)
- **Initiatives to meet target:** Installation of new Sidewell furnace and scrap treatment line at Metalex, and CBA's inaugural Recycling Center
- **2023 results:** 66.9% recycled content at Metalex

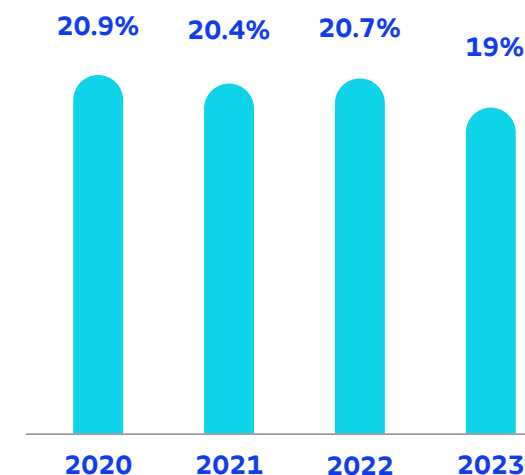
Recycled content in Metalex (SP) billets



Increase the ratio of aluminum recycled from industrial and end-of-life scrap in billet production at the Alumínio (SP) plant to 50%

- **Type:** Absolute target
- **Baseline:** 2019
- **Timeframe:** 2030
- **Scope:** Internal and external scrap consumption for billet production
- **Operations:** Alumínio plant (SP)
- **Initiatives to meet target:** Install hybrid pit for billet production (Pit 6)
- **2023 results:** 16% recycled content in billets produced at Alumínio

Recycled content in Alumínio plant (SP) billets

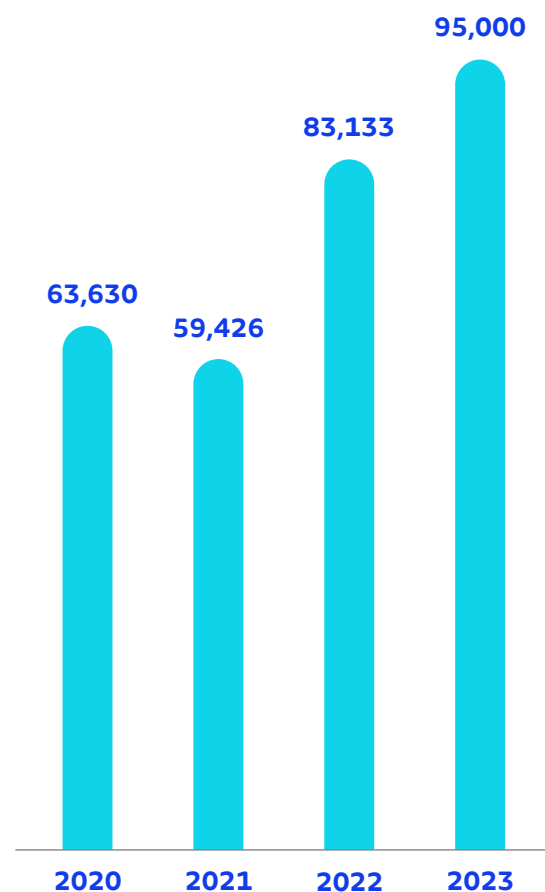




Increase the ratio of scrap collected from external sources for recycling

- **Type:** Absolute target
- **Baseline:** 2019
- **Timeframe:** 2030
- **Scope:** External scrap sourced for recycling and production processes
- **Operations:** Alumínio (SP), Metalex (SP), Alux (SP) and Itapissuma (PE)
- **Initiatives to meet target:**
Developed metals sourcing department to source scrap from the market, and created a Processing & Recycling Center at Metalex from which materials are distributed to all CBA operations
- **2023 results:** 14.2% recycling rate in CBA processes, with 95,000 metric tons of external scrap consumed

Volume of externally sourced scrap (in metric tons)



BIODIVERSITY TARGETS



Create/expand 1 hectare of ecological corridors for every 10 hectares of mined and reclaimed land

- **Type:** Absolute target
- **Baseline:** 2019
- **Timeframe:** 2030
- **Scope:** Mine site reclamation process
- **Operations:** Mines
- **Initiatives to meet target:** CBA reclaims decommissioned mine sites for use in agricultural activities, fully integrating them with the surrounding landscape. The Company ensures mined land is returned to landowners in the same or better condition than before it was mined. In 2022, the Company initiated a program to plant more than 90,000 large-sized saplings of species

native to the Atlantic Forest. CBA is also developing methodologies to formalize wildlife corridors

• **2023 results:**

- 6,864 saplings planted and 61 hectares rehabilitated in Zona da Mata
- 200 hectares of land selected for CBA's Reflora project

CBA HAS SEVERAL ENVIRONMENTAL PROTECTION AND BIODIVERSITY CONSERVATION PROGRAMS



Legado das Águas (SP)

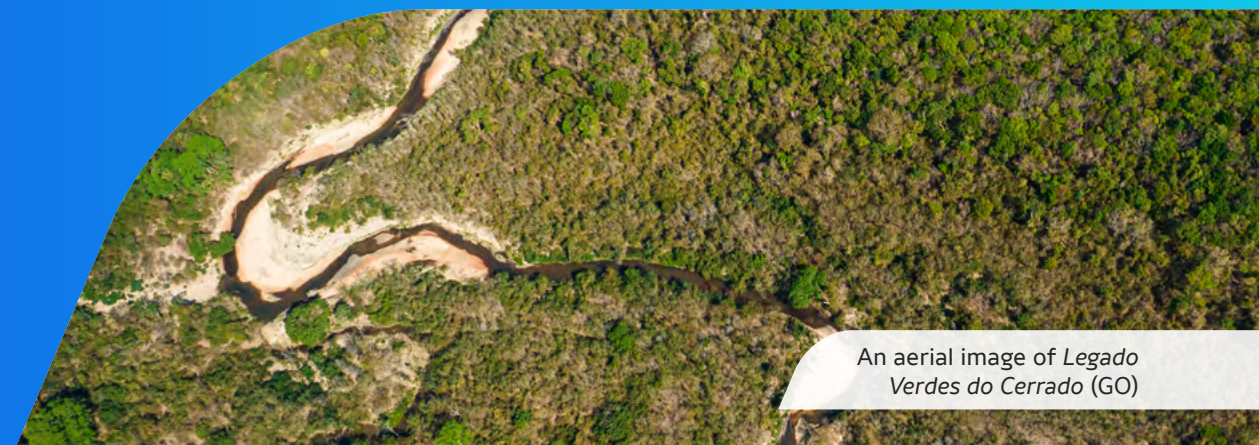
Legado das Águas

CBA is the founder and sponsor of the *Legado das Águas* (“Water Legacy”) reserve, the largest private Atlantic Forest reserve in Brazil, covering an area of 31,000 hectares in the municipalities of Juquiá, Miracatu and Tapiraí, in Brazil’s southeastern state of São Paulo. The reserve reconciles forest protection with scientific research and new-economy activities such as native plant production and public use. In 2023, the reserve supported a project, called “Intelligent Forests”, developed at the Facens University Center in collaboration with the Newton Paiva Institute (MG) and the Pará University Center (CESUPA), with support from the Dom Bosco University Center (CNDB).

Legado Verdes do Cerrado

Legado Verdes do Cerrado (“Cerrado Green Legacy”), owned by CBA and managed by Reservas Votorantim, covers an area of 32,000 hectares including the Engenho and Santo Antônio da Serra Negra sub-divisions in Niquelândia, located in the northern region of Goiás State.

Operating on a sustainable model, *Legado Verdes do Cerrado* supports biodiversity protection by integrating traditional agricultural (20% of the area consists of pastures and cropland) with new economy activities (80% of the area is covered by highly conserved *Cerrado*), promoting local social and economic development through research, innovation, and shared value creation. *Legado Verdes do Cerrado* hosts the REDD+ *Cerrado* program, covering 35% of the area, as well as reforestation initiatives for carbon offsets. Learn more about the project on page 82.



An aerial image of *Legado Verdes do Cerrado* (GO)

Production process solutions

CBA has a vertically integrated value chain. From Sustainable Mining processes to decarbonization initiatives, the Company has a robust plan for mitigating climate change.

Key

● Stage's share in total emissions



Mines

Mine reclamation

- **What it is:** Reforestation to reclaim mined land.
- **Carbon removals:** 532.23 tCO₂e

Refinery

Biomass Boiler Retrofit

- **What it is:** boilers retrofitted to use biomass as fuel.
- **Emissions reduction:** more than **60%** of emissions at this stage.

Filter press

- **What it is:** the filter press processes the red mud residue produced by the Refinery.
- **Emissions reduction:** N/A – This is a climate adaptation project

Smelters

Smelter Upgrade

- **What it is:** an upgrade of the pot feed system to an automated spot feed system.
- **Projected emissions reduction:** **20%** of emissions at this stage and 17 MW of electricity per year.

Casting and recycling plants (Alux and Metalex)

Increase in scrap consumption

- **What it is:** CBA's recent acquisition of Alux has increased the recycled aluminum content in the Casting and Metalex facilities.
- **Emissions reduction:** between **3.52 tCO₂e** and **4.94 tCO₂e** per metric ton of primary aluminum replaced by scrap*.

Downstream and Itapissuma

Incorporation of recycled scrap

- **What it is:** increased use of recycled aluminum in production.
- **Emissions reduction:** between **3.74 tCO₂e** and **6.28 tCO₂e** per metric ton of primary aluminum replaced by scrap*.

Metal yields

- **What it is:** efforts to increase metal yields.
- **Emissions reduction:** **0,023 a 0,047 tCO₂e** for every **1%** improvement in metal yield, depending on the product

* Includes emissions in the supply chain for primary aluminum produced or purchased by CBA (integrated plant and segmented plants).

Environmental protection reserves

Support environmental protection and carbon capture

- **Legado das Águas:** the largest private Atlantic Forest reserve in Brazil, covering an area of **31,000** hectares.
- **Legado Verdes do Cerrado:** **32,000** hectares. Hosts Brazil's first REDD+ Cerrado carbon credit certification program.

Energy Business

Supplies renewably sourced electricity from **22** hydroelectric power plants and **2** windfarms.

TCFD Content Index

TCFD disclosure	External references	Chapter reference	Sub-chapter reference
Governance: Disclose the organization’s governance around climate-related risks and opportunities.			
a. Describe the board’s oversight of climate-related risks and opportunities	2023 CDP Climate-Change disclosure: C1.1a, C1.1b	GOVERNANCE	Chapter opening
b. Describe management’s role in assessing and managing climate-related risks and opportunities	2023 CDP Climate-Change disclosure: C1.1a, C1.2	GOVERNANCE	Chapter opening
Strategy: Describe the impact of climate-related risks and opportunities on the organization’s businesses, strategy, and financial planning.			
a. Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term	2023 CDP Climate-Change disclosure: C2.1a, C2.1b, C2.2, C2.3a, C2.4a	RISK MANAGEMENT	Risk mapping
		OPPORTUNITIES	Chapter opening
			Opportunity pipeline
b. Describe the impact of climate-related risks and opportunities on the organization’s businesses, strategy, and financial planning	2023 CDP Climate-Change disclosure: C3.1, C3.2a, C3.2b, C3.3, C3.4	GOVERNANCE	Engaging the value chain
		STRATEGY	Chapter opening
			2030 ESG Strategy
			Climate-related funding
			Climate scenarios
			Competitiveness Management
		OPPORTUNITIES	Technology Management
c. Describe the resilience of the organization’s strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario	2023 CDP Climate-Change disclosure: C2.1a, C3.2a, C3.2b, C3.4	STRATEGY	Innovation & Digital Office
			Climate-related funding
		TARGETS	Climate scenarios
			Decarbonization targets under CBA’s 2030 ESG Strategy

TCFD disclosure	External references	Chapter reference	Sub-chapter reference
Risk Management: Disclose how the organization identifies, assesses, and manages climate-related risks.			
a. Describe the organization's processes for identifying and assessing climate-related risks	2023 CDP Climate-Change disclosure: C2.2, C2.2a	RISK MANAGEMENT	Chapter opening Factors considered
b. Describe the organization's processes for managing climate-related risks	2023 CDP Climate-Change disclosure: C2.2	RISK MANAGEMENT	Responsibilities for risk management Risk mapping
c. Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management	2023 CDP Climate-Change disclosure: C2.2	RISK MANAGEMENT	Chapter opening
Metrics and Targets: Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.			
a. Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process	2023 CDP Climate-Change disclosure: C1.3a, C2.3a, C2.4a, C3.2a, C3.5a, C11.3a	GOVERNANCE	Remuneration tied to climate performance
		STRATEGY	Climate scenarios Carbon pricing
		RISK MANAGEMENT	Physical risks Transition risks
b. Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks	2023 CDP Climate-Change disclosure: C5.3, C6.1, C6.2, C6.3, C6.5, C6.5a, C6.7a	RISK MANAGEMENT METRICS	Transition risks Emissions inventories
c. Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets	2023 CDP Climate-Change disclosure: C4.1a, C4.1b, C4.2b, C4.2c, C4.3b	TARGETS	SBTi-approved GHG reduction targets Net zero Other climate-related targets

Appendices

Verification Statement

No 07/2024

This Verification Statement documents that **BVQI DO BRASIL SOCIEDADE CERTIFICADORA LTDA** has carried out verification activities in accordance with the Verification Specifications of the Brazilian GHG Protocol Program and the ABNT NBR ISO 14064-3:2018 standard.

Inventory Organization:	Companhia Brasileira de Alumínio
CNPJ:	61.409.892/0001-73
Address:	Rua Eng. Luis Carlos Berrini, 105, 14º andar - 347 - - Cidade Monções – São Paulo – SP - 04571-900, Brazil
Accountable:	Raquel Martins Montagnoli
Email:	raquel.montagnoli@cba.com.br

The greenhouse gas (GHG) emissions reported by the Inventory Organization in its emissions inventory, from January 1 to December 31, **2023**, are verifiable and comply with the requirements of the Brazilian GHG Protocol Program, detailed in the Specifications of the Brazilian GHG Protocol Program for Accounting, Quantification and Publication of Corporate Inventories of Greenhouse Gas Emissions (EPB).

CONFIDENCE LEVEL

The Verification Body (OV) has assigned the following level of confidence to the verification process:

X	Verification with a reasonable level of confidence
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“The inventory organization’s greenhouse gas inventory for the year **2023** is materially correct, is a fair representation of GHG data and information, and has been prepared in accordance with EPB.”

SCOPE OF VERIFICATION

The inventory for the year 2023 of the inventory organization was verified within the following scope:

Organizational boundaries		Operational limits	
X	Operational control	X	Scope 1
		X	Scope 2 – location-based approach
	Corporate participation	X	Scope 2 – purchase choice-based approach
		X	Scope 3

The following were excluded from verification: N/A

FACILITIES VISITED

Installation	Relationship with the Holding Company	Address	Date of visit
Aluminum Factory – SP	Factory / Headquarters	R. Moraes do Rêgo, 347 – Vila Industrial, Alumínio – SP, 18125-000. Brazil. (on-site visit)	02/19/2024 (in-person)
Headquarters – Corporate	Headquarters – Corporate	R. Moraes do Rêgo, 347 – Vila Industrial, Alumínio – SP, 18125-000. Brazil (remote through Information and Communication Technology – ICT)	20/02/2024 21/02/2024 22/02/2024 23/02/2024 06/03/2024 07/03/2024 (remote)

TOTAL VERIFIED EMISSIONS ACROSS THE ORGANIZATION - OPERATIONAL CONTROL APPROACH

GHG emissions in tons of CO ₂ equivalent (tCO ₂ e) Global Corporate Inventory				
GHG	Scope 1	Scope 2: Location-based approach	Scope 2: Purchase Choice-Based Approach	Scope 3 (if applicable)
CO ₂	916,956.358	242,153.082	-	1,335,799.987
CH ₄	199.864	3,126.984	3,126.984	328.076
N ₂ O	385.310	3,945.850	3,945.850	2,362.210
HFCs	5,471.389	-	-	-
PFCs	435,147.360	-	-	-
SF ₆	141.000	-	-	-
NF ₃	-	-	-	-
TOTAL	1,358,308.331	249,225.916	7,072.834	1,338,490.273
Biogenic CO₂	8,407.844	416,309.075	416,309.075	18,773.075

TOTAL REMOVALS VERIFIED ACROSS THE ORGANIZATION - OPERATIONAL CONTROL APPROACH

Removal of biogenic CO ₂ (tCO ₂ e)				
GEE	Scope 1	Scope 2: Location-based approach	Scope 2: Purchase Choice-Based Approach	Scope 3 (if applicable)
Biogenic CO ₂	532.230	-	-	-

OTHER NON-KYOTO PROTOCOL GREENHOUSE GASES (tCO₂e)

GEE	Emissões tCO ₂ e
-	-

EMISSION INTENSITY INDICATORS BY PRODUCTIVE AREA (SCOPES 1 AND 2)

Production Area	Indicator	Tons (t) of CO ₂ e per ton of production unit
Mining	0.009	tCO ₂ e/t bauxite
Refinery	0.22	tCO ₂ e/t alumina
Smelter	3.23	tCO ₂ e/t molten aluminium
Casthouse	0.13	tCO ₂ e/t cast products
Downstream	0.11	tCO ₂ e/t downstream products
Metalex	0.28	tCO ₂ e/t cast products
Alux	0.27	tCO ₂ e/t cast products
Itapissuma	0.93	tCO ₂ e/t downstream products

EMISSION INDICATORS BY PRODUCT: MOLTEN ALUMINUM - FACTORY

Production/Product Area	Indicator	Tons (t) of CO ₂ e per tonne of unit of product
Molten aluminum (Scope 1 & 2)*:	3.87	tCO ₂ e/t molten aluminium
Molten Aluminum (Scope 1, 2 & 3	5.06	tCO ₂ e/t molten aluminium

*Considering scope 1 and 2 emissions from the CBA aluminum chain (mining, refinery, electrolysis and smelting)
 ** Considering scope 1 and 2 emissions from the CBA aluminum chain (mining, refinery, electrolysis and smelting) and scope 3 emissions (category 1 – purchase of consumer goods, category 3 – fuel and energy-related activities not included in Scopes 1 and 2, and category 4 – upstream transport)

EMISSION INDICATORS BY PRODUCT: ALUMINUM CASTING

Production/Product Area	Indicator	Tons (t) of CO ₂ e per tonne of unit of product
Foundry/Ingot	3.50	TCO ₂ e/t ingot
Foundry/Billet	2.92	tCO ₂ e/t billet
Casting / Caster roll	3.10	tCO ₂ e/t caster roll
Casting/Plate	2.45	tCO ₂ e/t plate
Casting/Rod	4.31	tCO ₂ e/t rod

Note: Considering all stages of the aluminum chain (Mining, Refinery, , Smelters, Casthouse and Support Areas).

EMISSION INTENSITY INDICATORS BY PRODUCT: PLASTIC PROCESSING

Production Area	Indicator	Tons (t) of CO ₂ e per tonne of unit of product
Downstream Extrusion	4.02	tCO ₂ e/t extrusion
Downstream/ DC Sheet	4.22	tCO ₂ e/t sheet(CC)
Downstream / DC Sheet	4.02	tCO ₂ e/t sheet(DC)
Downstream/ Medium Sheet	4.16	tCO ₂ e/t sheet Medium
Downstream/Foil	4.79	tCO ₂ e/t foil

Note: Considering all stages of the aluminum chain (Mining, Refinery, Smelters, Casthouse, Downstream and Support Areas).

EMISSION INTENSITY INDICATORS BY METALEX PRODUCT

Production Area	Indicator	Tons (t) of CO ₂ e per ton of production unit
Metalex/Billet	2.28	tCO ₂ e/t billet

Note: Considering full scope 1 and 2 emissions, and partial scope 3 related to the aluminum chain / Category 1 – Purchase of goods and consumption: Purchase of aluminum ingot).

ALUX EMISSION INTENSITY INDICATORS BY PRODUCT

Production Area	Indicator	Tons (t) of CO ₂ e per ton of production unit
ALUX	0.31	tCO ₂ e/t ingot

Note: Considering full scope 1 and 2 emissions, and partial scope 3 related to the aluminum chain / Category 1 – Purchase of goods and consumption: Purchase of aluminum ingot).

ITAPISSUMA EMISSION INTENSITY INDICATORS BY PRODUCT

Production Area	Indicator	Tons (t) of CO ₂ e per ton of production unit
ITAPISSUMA/Sheet	5.66	tCO ₂ e/t sheet
ITAPISSUMA/Foil	4.17	tCO ₂ e/t foil

Note: Considering full scope 1 and 2 emissions, and partial scope 3 related to the aluminum chain

CONFLICT OF INTEREST (CDI)

I, Rafael da Silva Caldeira, certify that no conflict of interest exists between the Inventory Organization and **BVQI DO BRASIL SOCIEDADE CERTIFICADORA LTDA**, or any of the individual members of the verification team involved in the verification of the inventory, as defined in chapter 3.2.1 of the Verification Specifications of the Brazilian GHG Protocol Program.

Rafael da Silva Caldeira, Lead Verifier

Date: 04/04/2024

CONCLUSION

As those responsible for the GHG inventory verification activities of the inventory organization in question, we certify that the information contained in this document is true.

Rafael da Silva Caldeira - Lead Verifier

Date: 04/04/2024

Thiago Milagres - Independent Reviewer

Date: 04/04/2024

REVISION (IF APPLICABLE)

Version:	01
Date:	04/04/2024
Justification:	fact discovered after verification

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EXTERNAL CONTRIBUTIONS

**TCFD consulting, writing and graphic design
Report**

Photo credits

Panoptica Multimídia, Lacerda Estúdio, Andrei Pires (*Legado das Águas* photos), Luciano Candisani (*Legado Verdes do Cerrado* photos) and CBA Archive

**Independent assurance of the GHG
inventory and emissions disclosures**

Bureau Veritas

Translation

LATAM – Latin American Translations