

# CBA Day 2021

Oct



# Our Evolving Strategy

## **Ricardo Carvalho**

Cba

Robust and diversified product pipeline 100% renewable power generation capacity

Positioned in the 1<sup>st</sup> quartile of the global cost curve

Vertically integrated across the aluminum value chain **O** cba

Aluminum solutions that transform people's lives

Strategically located near Brazil's largest consumer center

Comprehensive product portfolio, with a highly flexible production mix Long-standing ESG agenda and one of the lowest emission rates in the global industry

## Our Evolving Strategy

continuous business transformation to build competitiveness and drive a new cycle of growth

#### 2015 - 2017

- Redesigned CBA Strategy
- Structured initiatives to improve competitiveness
- A focus on Energy, Primary Aluminum and Downstream
- Expanded collaborations with customers (solutions and services)

#### 2018 - 2020

- Evolved and strengthened the CBA Culture
- Transformation Program
- Relevant breakthrough in the US market
- Sustainability embedded in our Strategy
- Itapissuma acquisition
- Beginning of CBA 4.0 Journey

2021 - 2023

- **Growth in synergy** with current businesses
- Maintain leadership in the Brazilian market, while expanding our horizons through exports
- Sustain efforts to build competitiveness, cementing our position in the 1<sup>st</sup> cost quartile in our industry
- Build on **ESG** commitments and practices
- Strengthen CBA's position as a low-carbon aluminum producer
- Innovation & Digital Transformation as value enablers
- Evolve our Digital Culture





### Build Competitiveness

### Accelerate Growth

# **O** cba

Aluminum solutions that transform people's lives

Drive Innovation and Collaboration Strengthen Leadership in ESG



## Accelerate Growth

Grow in **synergy** with current businesses

Expand **production** — with a focus on higher valueadded products — and build **recycling** capabilities

Explore and capture **M&A** opportunities



## Build Competitiveness

Sustain global **cost leadership** and lowest CO<sub>2</sub> **emissions** 

Maintain **vertically integrated** operations with **renewable power** 

Capture synergies across operations

Expand **Innovation & Technology** initiatives, in a customer-centric model



# Strengthen leadership in ESG

Deliver **Low Carbon Aluminum** through technology, recycling and renewable energy

Expand the scope of our national and international **certifications** 

**Diversity**, equity and inclusion

Engage our **supply chain** 

Preserve **biodiversity** 

Create value through **social programs** 



## **Drive Innovation and Collaboration**

**Co-engineering and innovation** with customers, research institutes, startups and other stakeholders to develop new **applications for aluminum** 

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Accelerate the Digital Transformation at CBA by integrating People, Processes, Technology and Cybersecurity

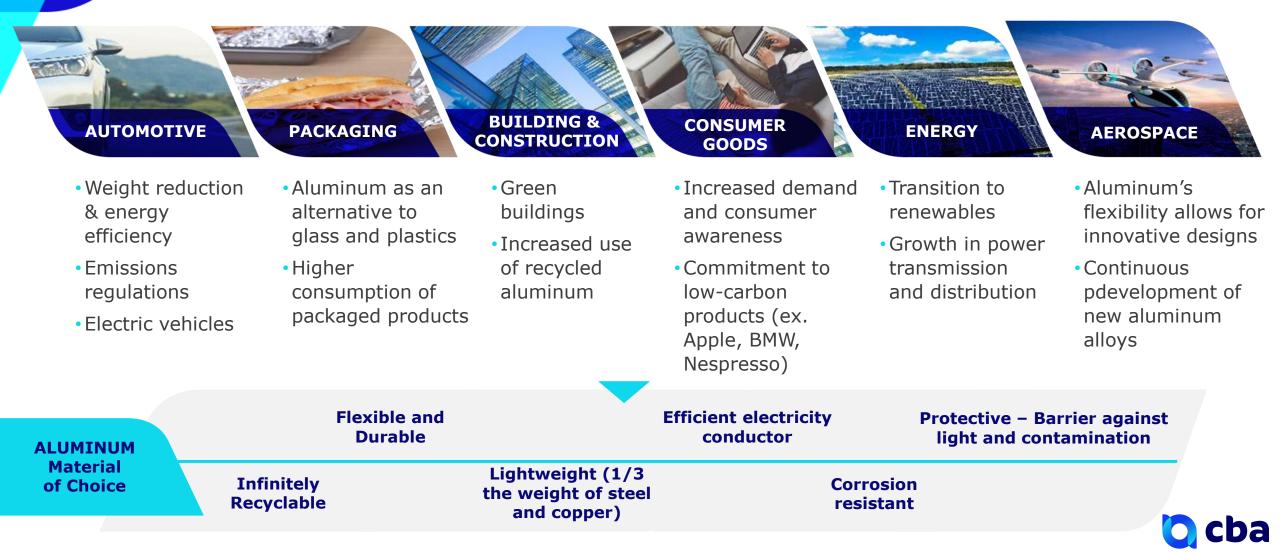
Technological developments focused on industrial processes to make our operations more competitive and sustainable

# **Global Aluminum Market** & CBA

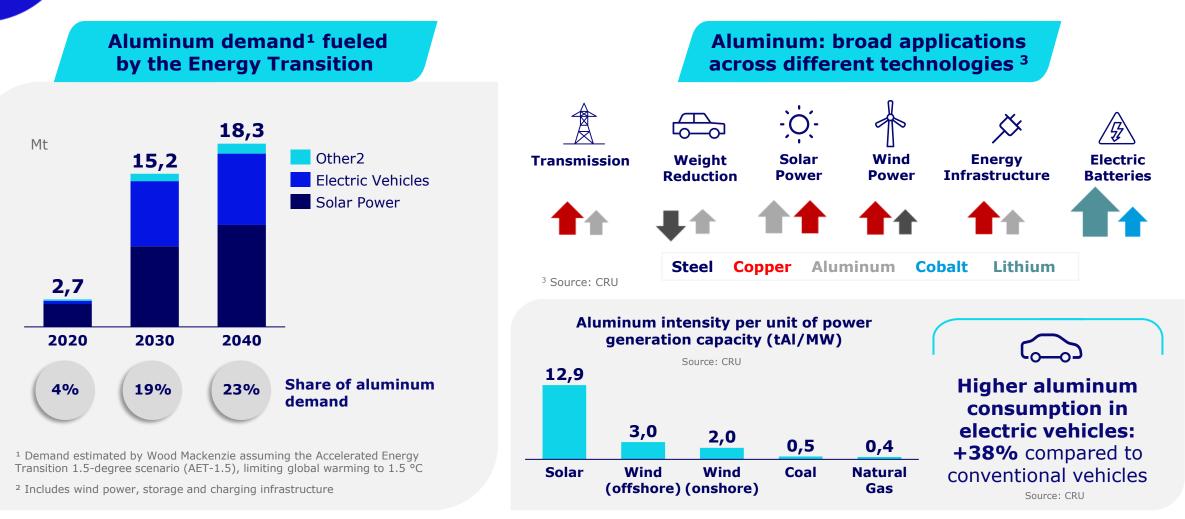
## Luciano Alves



#### Superior properties, energy transition, and a low-carbon future: key drivers of future aluminum demand



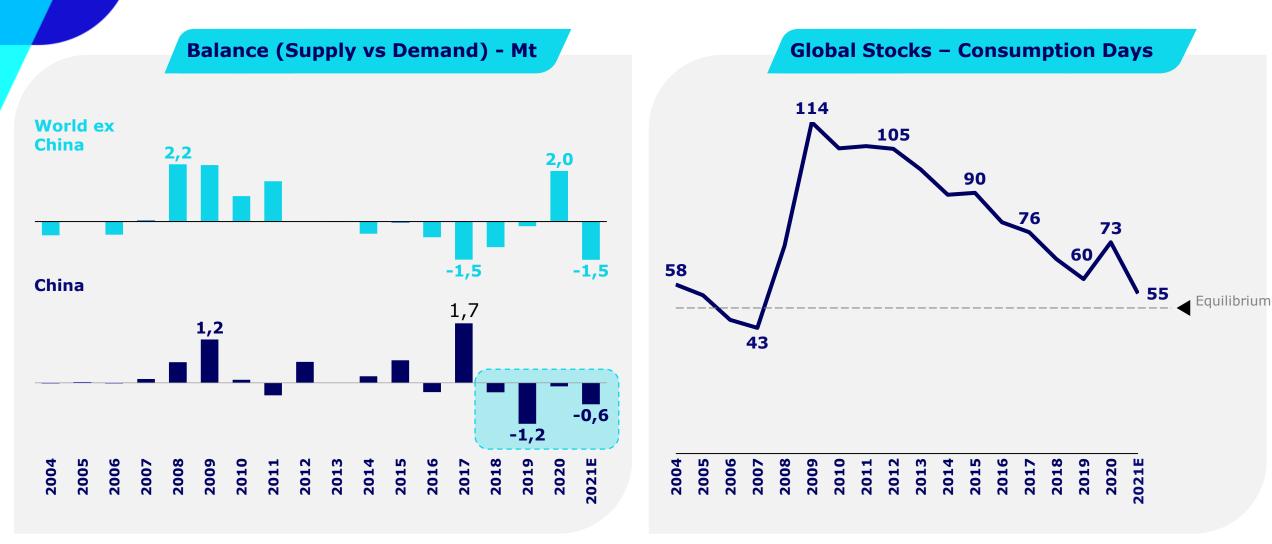
**Energy transition will drive demand for aluminum over the coming** years, especially in the solar power and electric vehicle segments





Sources: Wood Mackenzie; CRU Aluminum Market Outlook - presentation prepared by CBA (June 2021); CRU Aluminum Market Outlook Apr 2021

#### **Positive fundamentals in the aluminum market:** China in deficit since 2018 and global stocks steadily declining



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# China's movements in the aluminum industry have a ripple effect on global market dynamics

China annualized primary aluminum production (Mt)







**Energy restrictions** in China have curtailed smelter production and delayed ramp-ups

CRU has revised its **China aluminum production growth estimate** from 6.5% to 3.5% in 2021. Production is expected to contract by -2.5% in 2022.

China is increasing **imports** to secure a sufficient supply of aluminum

**Emissions reduction targets:** potential impact in supply and demand dynamics, driving up prices

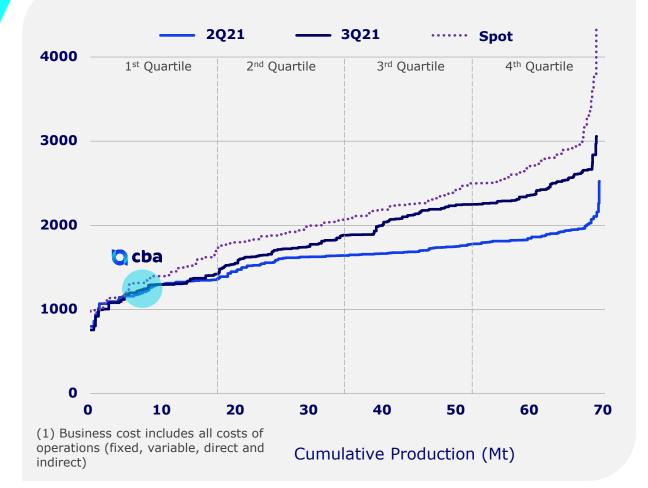
**China reaching its capacity cap of 45Mt** in the medium term could reconfigure aluminum trade flows and the supply and demand balance



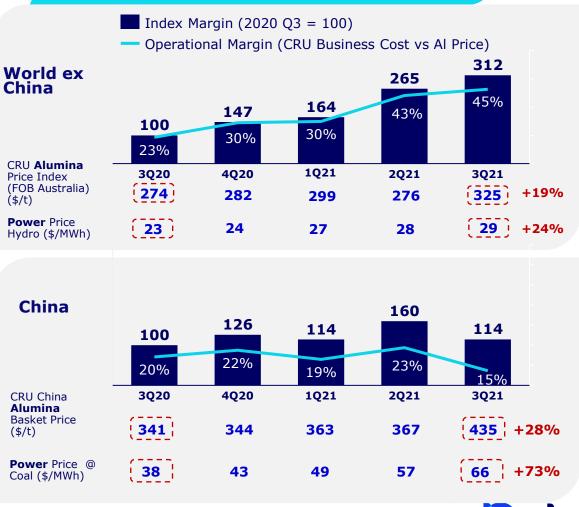
Sources: CRU Aluminum Monitor October 2021; CRU Aluminum Market Outlook July 2021, and CBA analyses.

### **Rising smelter costs, especially energy and alumina costs, have continued to support LME Aluminum price**

CRU Business Cost Curve<sup>1</sup>- US\$/t

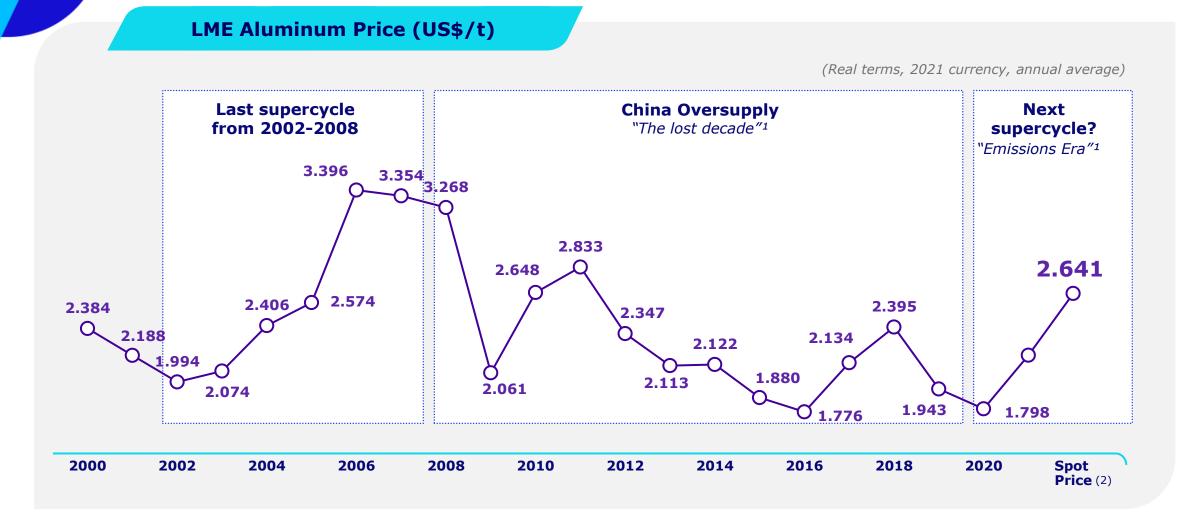


Cost pressure intensifies, but margins remain healthy



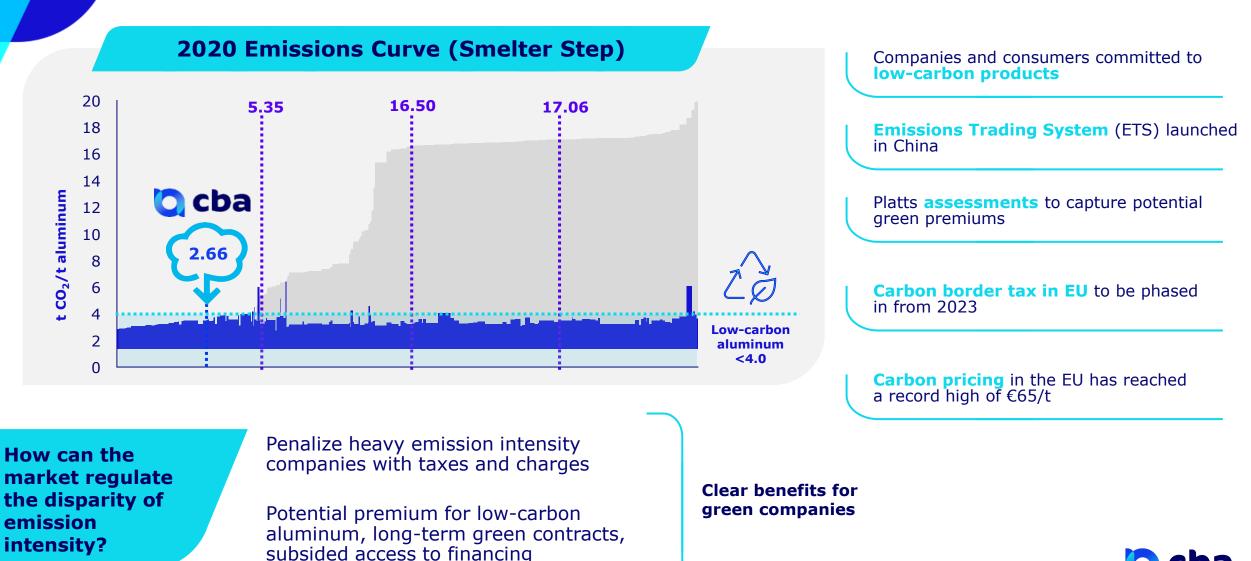
Sources: CRU Aluminium Live Q&A 29 September 2021 and CBA analyses

#### Growing demand, constrained supply and decarbonization trends could push up aluminum prices in the future





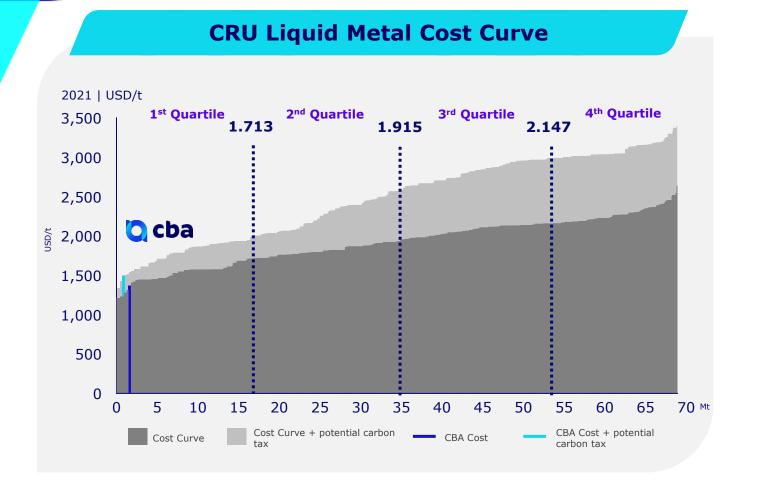
### Potential green premium or lower carbon taxes could benefit low carbon aluminum producers, including CBA

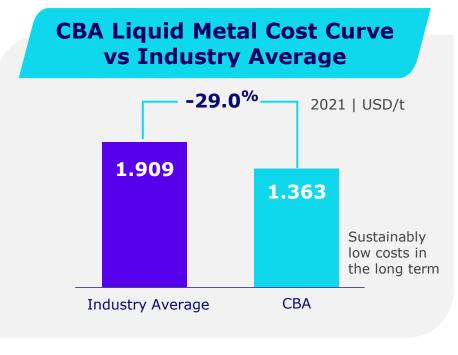


Sources: CRU Smelter Cost Model Q3 2021, Financial Times, and CBA analyses.



# Vertical integration and renewable power make CBA competitive even in a potential carbon tax scenario





CRU estimates a potential carbon tax of up to US 50/t CO<sub>2</sub>/t Al

Impacts on players' competitiveness could be asymmetric due to considerable differences in smelter emissions



### **Global Aluminum Market: key takeaways**



**Favorable market fundamentals**: global deficit, declining stocks, China as net importer



**Cost inflation**, especially **energy and alumina prices**, has sustained current aluminum price levels



Smelters have continued to see healthy margins, especially those with captive renewable power



Key drivers affecting Chinese market dynamics: **emissions reduction, power availability and supply control** 



Diversified aluminum demand driven by current applications, but new applications linked to current **Decarbonization and Electrification trends** could push up consumption

### Key factors to watch in 2022

Alumina, coal and energy prices: risk of smelter shutdowns or curtailments

#### Post-pandemic demand recovery

Global stock levels and potential metals shortages

Cost inflation and logistics bottlenecks affecting supply chains



# Business Strategy



# **Primary Aluminum Business**

## **Alexandre Vianna**



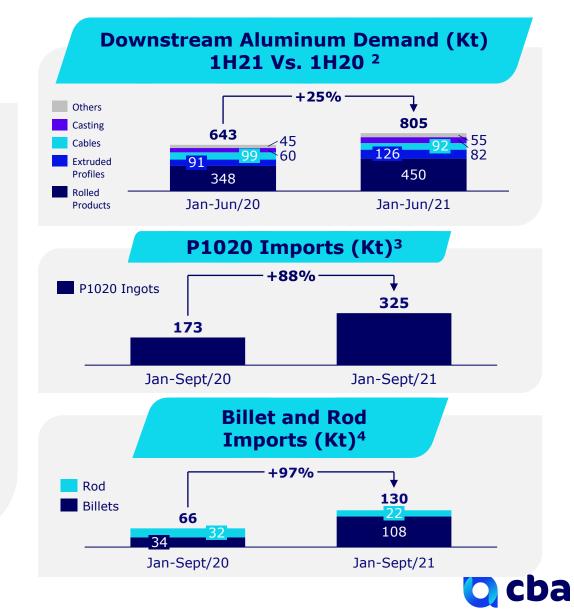
# Brazil market in deficit and dependent on imports to meet strong aluminum demand

#### CBA — Downstream Aluminum Demand Albrás P1020 Imports 1.422 1.398 1.341 1.278 1.212 1.038 1.025 967 938 935 446 447 327 308 379 324 352 344 306 355 317 276 253 248 223 2016 2017 2018 2019 2020

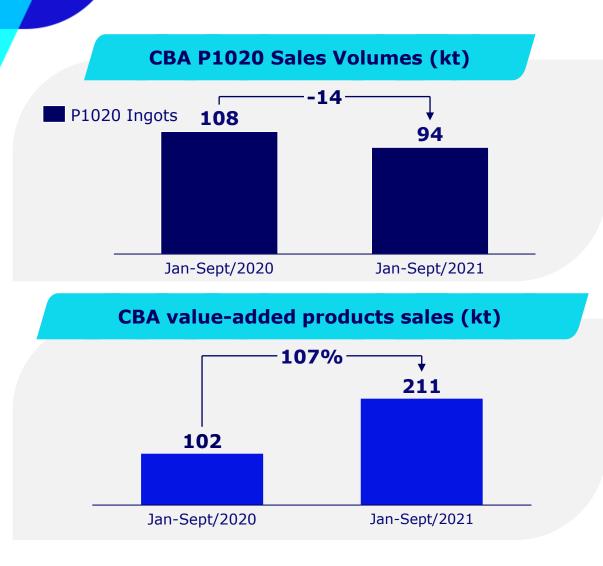
**Primary Aluminum Supply Evolution** 

vs. Downstream Demand in Brazil (Kt)<sup>1</sup>

<sup>1</sup>Source: ABAL Yearbook 2020 <sup>2</sup>Source: Revista Alumínio (data from ABAL) <sup>3</sup>Source: SECEX <sup>4</sup>Source: SECEX



CBA has reduced ingot production in order to increase output of value-added products, leveraging sales in the period by 107%



#### Key market drivers

 Strong performance in building and construction sector: building materials revenues rose by 15.2% YoY in September (ABRAMAT). New extruders started operation in the Southeast.

• Real estate market ended 2Q with growth in launches and sales. (CBIC)



- Despite the semiconductor supply crisis, automotive sales have continued to recover, rising by 16% YoY in Jan-Sept/21 (ANFAVEA)
- Logistics constraints have limited imports of finished aluminum wheels



- Brazil is now one of the top 15 countries for solar power generation (AESF)
- The aluminum-can market has seen rapid growth, with players investing in expansion. CBA has benefited indirectly from reduced competition in other markets





#### Pot Rooms Technology upgrade

## **Primary Aluminum Business Strategy**

- Strengthen CBA's position as a producer of low carbon aluminum at competitive costs
- Lead the Brazilian market for primary aluminum
- Manage environmental impacts from our operations

#### **KEY INITIATIVES**

#### **Dry Disposal**

**Production increase:** restart of Pot Rooms 3 e 1

## Pot Room Technology Upgrade





 Smelter pot feed process upgrades and automation

Paste plant upgrade to produce semi-dryDescription paste

 CO<sub>2</sub> emissions reduction from 2.66 to 2.18 tCO<sub>2</sub>/tAl



**Status** 

Project approved for implementation and now in procurement phase

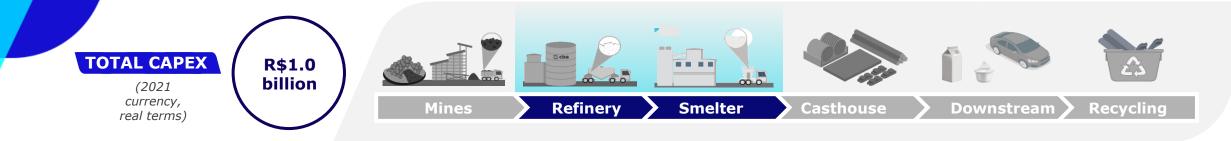
✓ Phased startup from 2023 to 2025







## **Primary aluminum production increase**





 Restart 1 ½ pot room to increase smelting capacity: +80 ktpa

Description

 Improve precipitation efficiency from 60 g/L to 80 g/L by removing organic and inorganic impurities from Bayer liquor (liquor purification)



Status

Restart 78 smelting pots at Pot room 3 – project approved and under procurement – Startup: 2022

 Restart 158 smelting pots at Pot Room 1 -FEL 3 - Startup: 2025

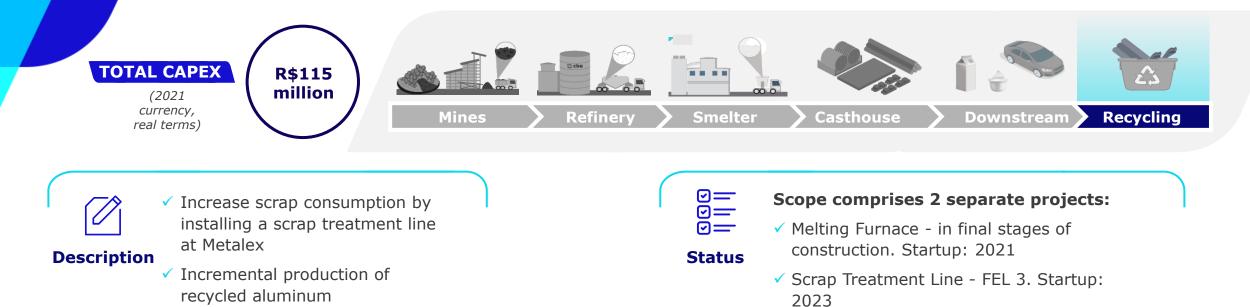


### Rationale

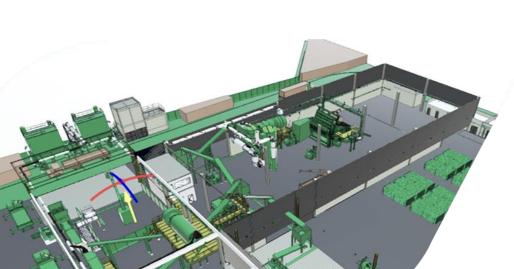
 Increase primary aluminum production to replace metal imports ✓ Increased production of low-carbon aluminum
 ✓ Lower Refinery consumption intensities
 ✓ Lower emissions of CO2 equivalent
 ✓ Reduced natural resource consumption



### **Recycling increase**



and CBA







## **Dry Disposal**





Filter press technology to dewater waste materials for dry disposal

#### Description \*

 Water and caustic soda reused in the Refinery process

- || || || ||
- Project in progress: filter press procurement completed, and worksite mobilized for civil construction

#### Status

Startup: 2024

ESG





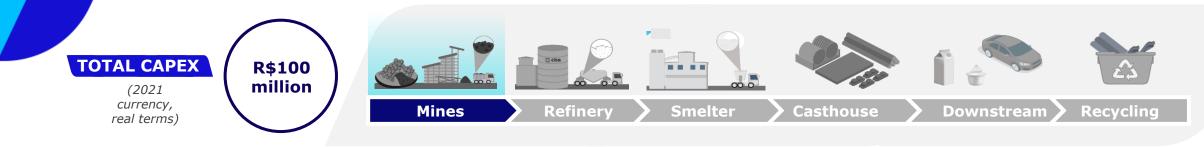
- Greater dam safety
- Waste materials readily reusable in other applications (e.g. cement industry)
- Water reuse within the process
- Reduced area requirement
   for waste disposal
- Reuse of water and caustic soda



# Innovation and Digital Transformation

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### **Mobile** bauxite beneficiation





Description

 Develop disruptive technology to establish a new and sustainable approach to mining, revolving around the use of compact, semi-mobile plants

- Part of the bauxite processed dry using crushing and screening equipment
- Replace crushing equipment with new technology
- ✓ Production of enriched soil





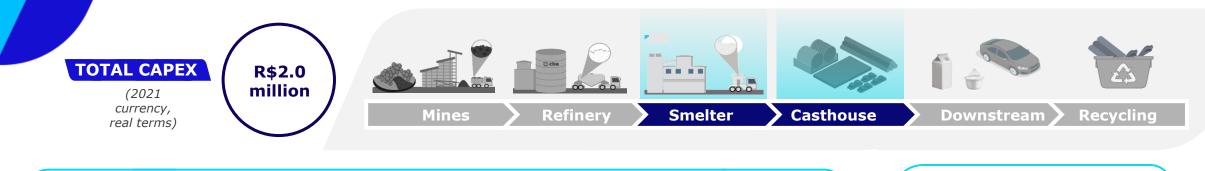
### Rationale

 Producing beneficiated ore near the mine site reduces haulage distances and expands economically viable bauxite reserves





## **Online Smelter Management (GOLF) Project**



 Integrated view of planning, scheduling and distribution of smelter output to the casthouse, powered by artificial intelligence to improve blend composition and optimize metal truck routes



#### Description

 Metal deliveries scheduled to match casthouse demand and smelter/melting furnace delivery rates



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# Downstream Business

## **Fernando Varella**





# **Downstream Business Strategy**

- Focus on developing **solutions** for the **transportation** segment
- Strong position in the Americas packaging industry
- Serve the value chain as a solutions provider, focusing on construction companies and distributors
- Explore **new solutions** in downstream aluminum products

#### **KEY INITIATIVES**

Investment in Building & Construction and Co-engineering

Higher **recycled content** in our operations

**Growth** through expansion, modernization or M&A

Carton and flexible packaging recycling (**ReAl Project**)

**Collaborations** with startups and technology developers

Strengthen customer relationships

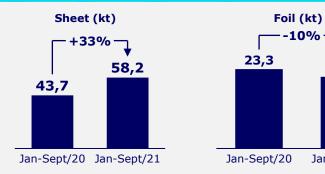
### **Downstream aluminum products sales rose by 24% YoY**

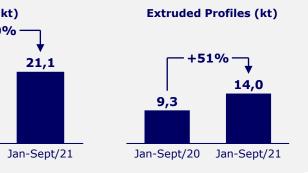


CBA currently has the largest foil production capacity in the Americas and is a relevant exporter to the US



### Imports have increased to meet rising demand. But CBA sales have outgrown imports in the Sheet and Foil segments



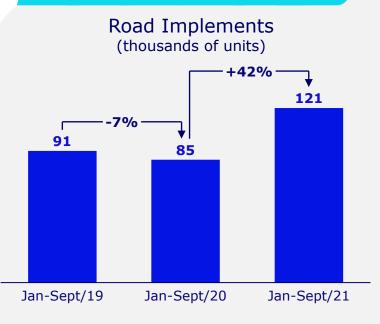


- CBA's domestic sheet sales have outgrown imports (75% vs 33%)
- Foil imports dropped by -10%, while CBA sales rose by 22%, gaining local market share
- Extruded profiles sales grew by 31% despite increase in imports



### Downstream growth in 2021 has exceeded pre-crisis levels in the segments where we operate

#### **1.** Transportation



- Despite the supply crisis, the automotive market has continued to see strong performance
- Sub-segments: light vehicles (+21%) and buses (+10%)

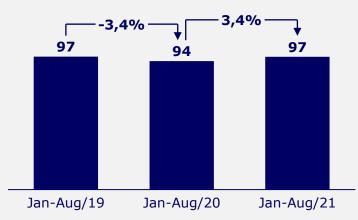
Aluminum demand (1H21 vs 1H20)

### +45%

## 2. Packaging

Packaging Production (Base 100)

#### **Overall Industry**

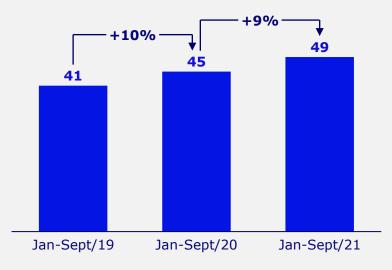


- All aluminum packaging segments have grown well above the overall industry
- CBA's packaging market has outgrown the Overall Industry



#### **3. Building & Construction**

#### Cement consumption (kt)



• Growing momentum in the sector has driven up aluminum demand





Source: LCA, ANFIR and ANFAVEA, Revista Alumínio (Data from ABAL) Source: IBGE – Oct

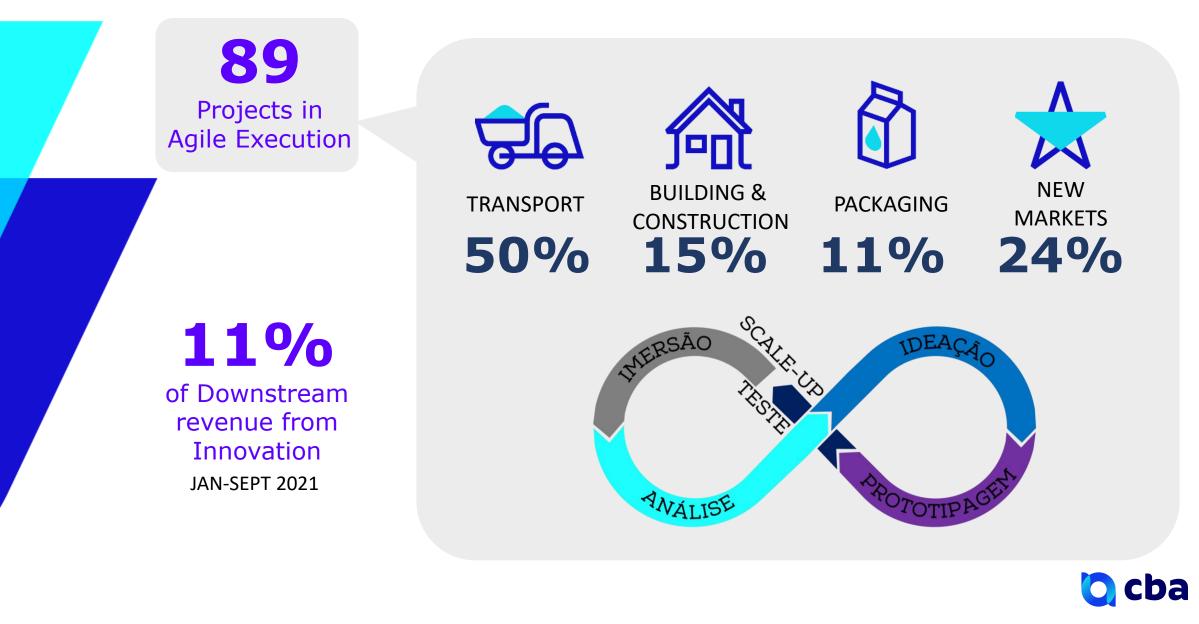
Source: IBGE – Oct/21, Revista Alumínio (Data from ABAL) Source: IBGE, SNIC, SecoviSP – Oct/21, Revista Alumínio (Data from ABAL)

# Innovation and Digital Transformation



### **Downstream Innovation**

Design Thinking Model

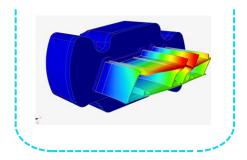


### **Digital Transformation**

Journey 4.0—a focus on safety, customer experience and closer connectivity to support agile decision-making

#### **Process automation**

Simulator Profile tooling software



Virtual reality training

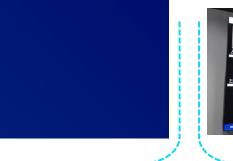




Safety - camera

monitoring





### Video analytics for online defect detection



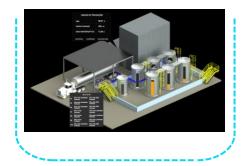


**Process Control** 



Oil distilling plant

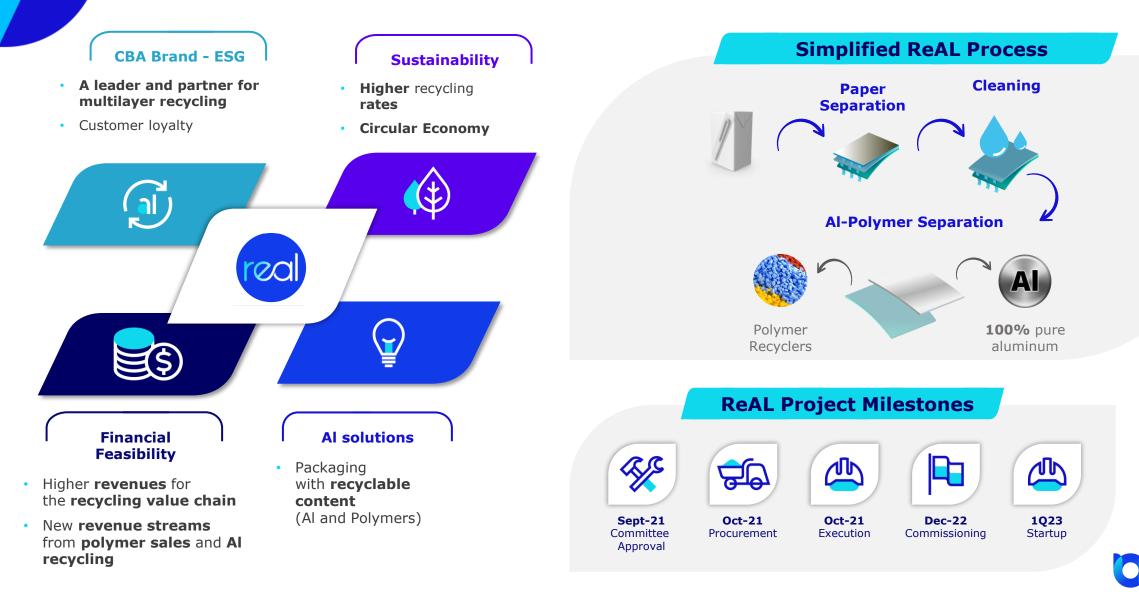






## **ReAl Technology | packaging trends and challenges**

Proprietary technology developed and patented by CBA to maintain aluminum as a sustainable solution for multilayer packaging and support higher rates of post-consumer recycling



# Energy Business

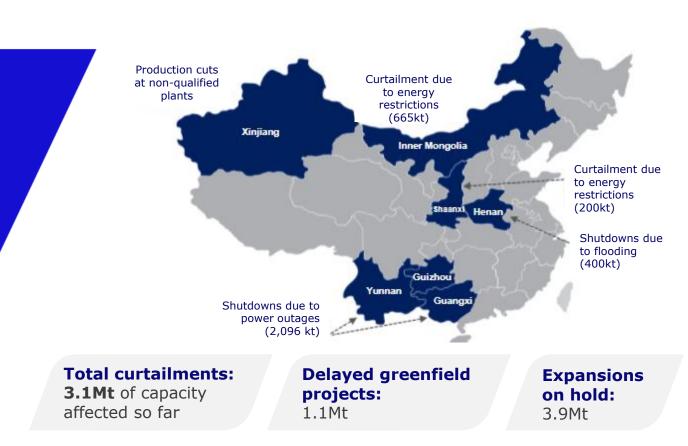
# **Luciano Alves**



# **Energy crisis – impacts on the Aluminum Industry**

Policy changes in China and higher energy prices in Europe are affecting aluminum production

#### Curbs on power use and a capacity cap in China are threatening aluminum production in the country:



### China

- "Dual-control" policy: targets for total energy consumption and energy intensity
- Coal: prices soared by ~260% in 2021 driven by higher demand, declining stocks, weather-related disruptions and a ban on imports from Australia, affecting coal-fired generation capacity

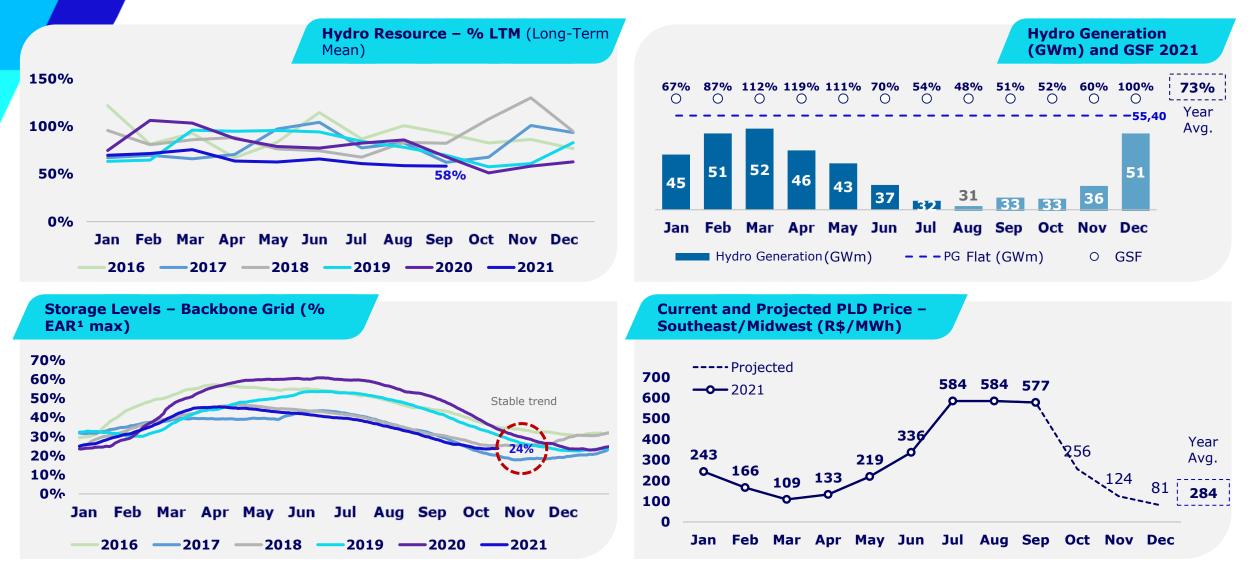
### **Europe**

- Natural Gas: rising global demand and an accelerated economic recovery have driven a sharp rise in gas prices, leading to aluminum smelter curtailments
- Spot Energy Prices: ~70% of European smelters are exposed to spot energy prices



Sources: Wood Mackenzie LME Forum 2021 Presentation (October 2021), and CBA analyses.

# **Brazil Energy Sector:** as water resource levels recover, electricity prices are likely to drop significantly



(1) Stored Energy (EAR) is the energy that can be generated by the volume of water available in a reservoir Sources: ONS and CCEE





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# Energy Business Strategy

- Commitment to generate renewable electricity for CBA's entire future energy requirement
- A robust generation portfolio with supplemental sources, strengthening our position as a self-generator
- Operating excellence to drive safety, efficiency and sustainability
- Energy business optimization supports generation as well as trading activities

### **KEY INITIATIVES**

Leverage expertise as a self-generator and Market Intelligence to develop new energy solutions

Investment in Wind and Solar

**Innovation and Technology in Plant Management**, Partnerships and Consortia/Joint Ventures

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### **Renewable Energy**



- **Phase 1:** replacement of hydro with wind power capacity (+171.5 MW)

**Description** • Phase 2: new renewables projects (up to 400 MW)



- Phase 1: start-up in 2023
- Acquisition completed in August-21 10-year PPA

#### Status • Phase 2: start-up targeted for 2024

• Wind and solar projects in study



### Rationale

- Replace hydro generation with concessions nearing expiration to support future growth in aluminum production
- Maintain vertical integration with renewable generation assets to assure world-leading cost efficiency
- Capital optimization, self-generator benefits and supplemental portfolio assets to reduce generation volatility



- Maintain vertical integration with renewable generation assets, sustaining global leadership for low emissions
- Efficient and sustainable operations management, including biodiversity
- Innovation and technology to support risk management and resource optimization in operation and maintenance

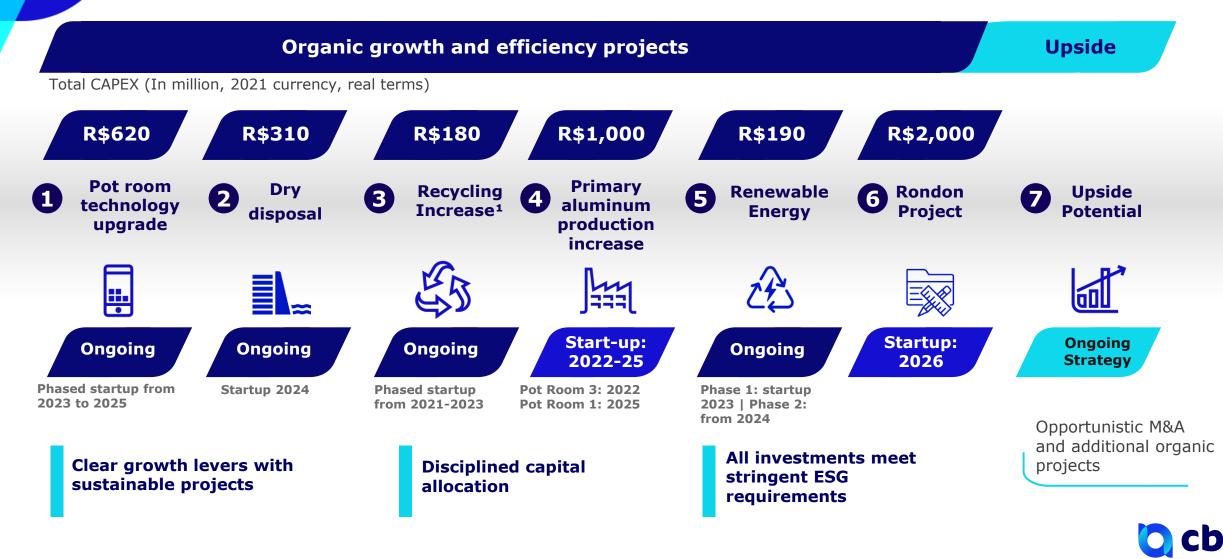


# Investments

# **Albino Júnior**



Diversified product pipeline to further strengthen our market leadership

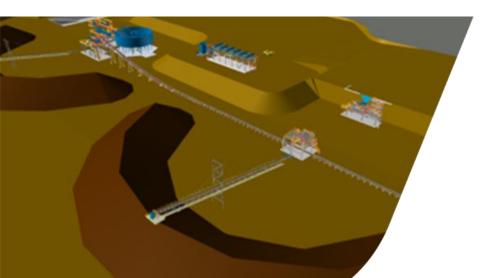


### **Rondon Project**





- Greenfield bauxite mine project in Pará, northern Brazil
- 1.8+ million metric tons of high-quality ore, mineable at competitive costs
- Description
  Scalable mine design: 4.5 Mtpa, expandable to 18 Mtpa
  - Competitive logistics: Served by the Carajás Railway to the Capesizecapable Port of Itaqui in Maranhão



### Rationale

 Extend CBA's long position in bauxite, with exports as primary focus.



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Status

 Work in progress to secure environmental license, develop logistics solutions and update economic feasibility study

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• Startup: 2026
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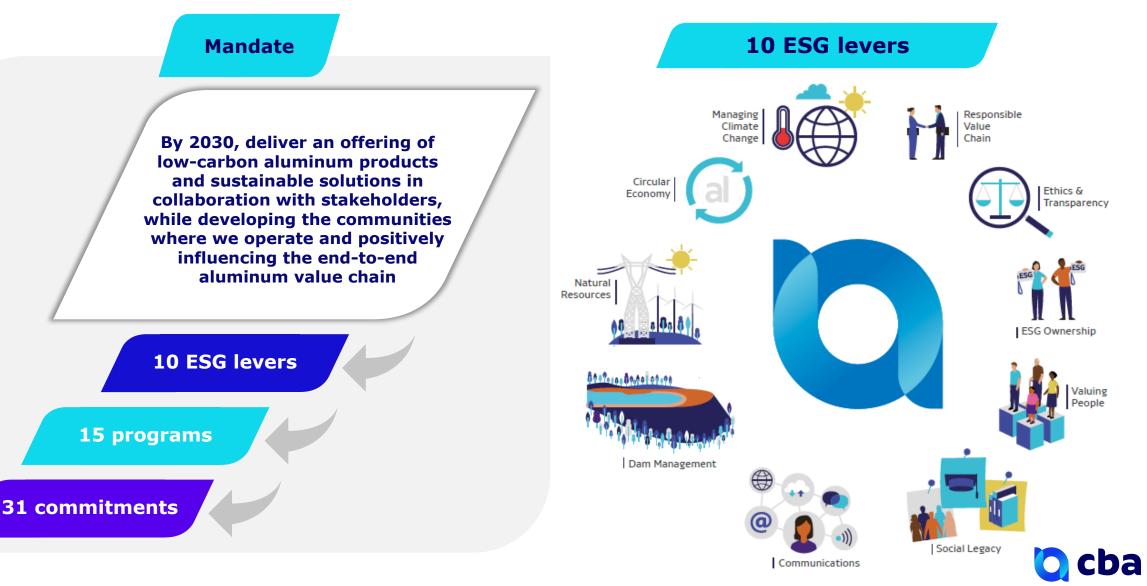




# Leandro Faria

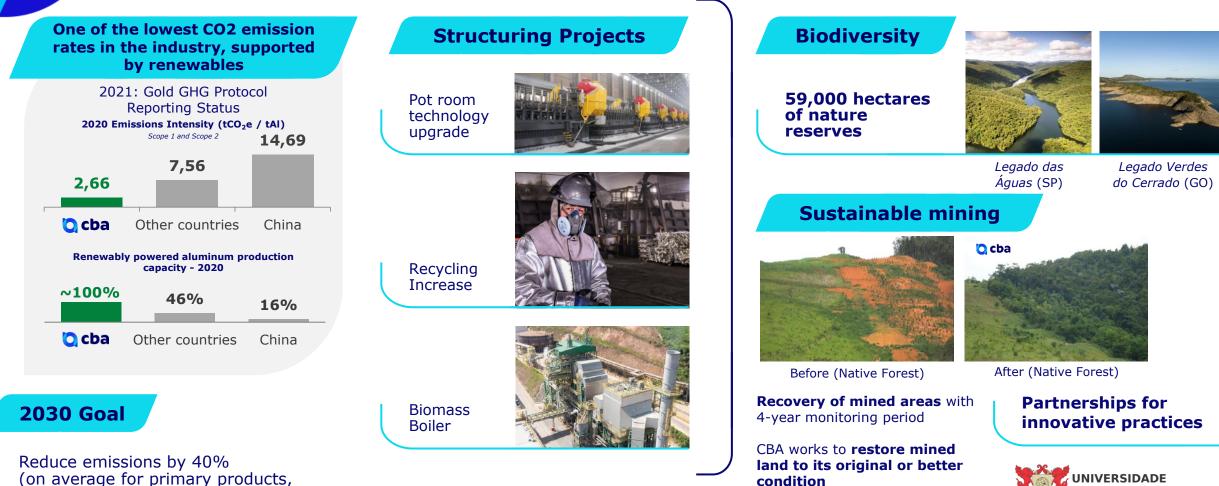


# CBA Strategy 2030: better aluminum for a better world



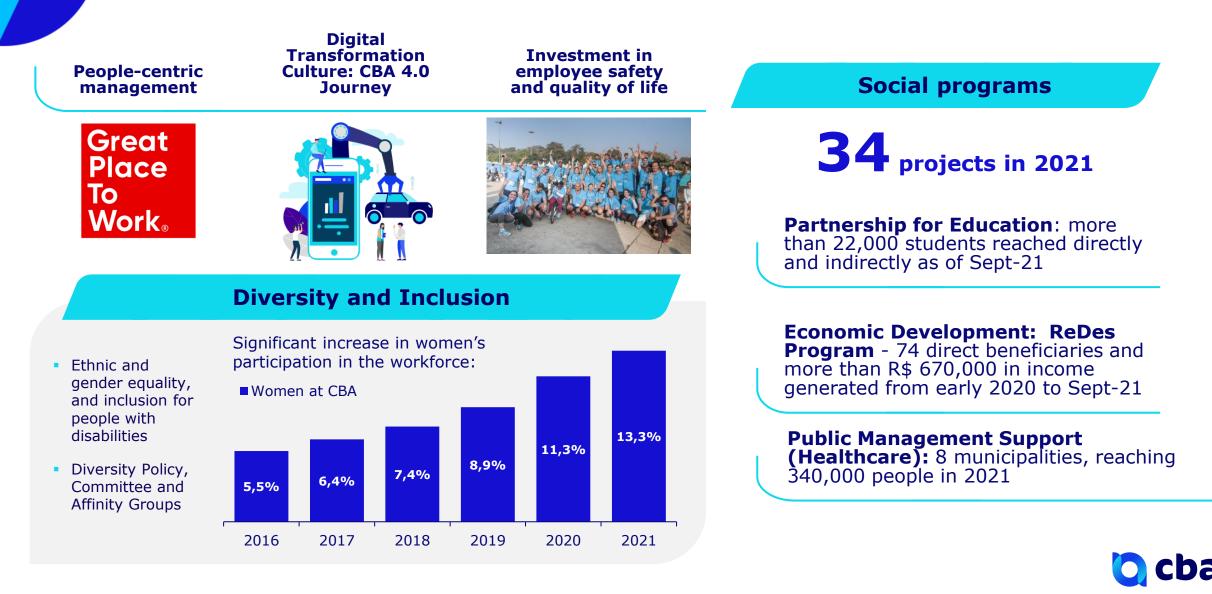
# **Environmental (E): positive impact on our ecosystem and robust environmental governance**

**FEDERAL DE VICOSA** 



(on average for primary products, cradle-to-gate), from 3.55 tCO2e/t Al in 2020 to 2.46 tCO2e/t Al in 2030

# Social (S): a focus on delivering significant and lasting benefits for people



# Governance (G): mature governance aligned with best practices

### Organizational Structure supported by Independent Committees



### **Commitments and International Certifications**



#### World-class governance practices

#### **Sustainable Procurement Program:**

- An initiative to engage the end-to-end value chain, from mining to the end stages of production
- The initiative comprises 7 stages to be implemented over the next 5 years, with defined owners and activities involving small, medium and large suppliers, including local suppliers:
- 1. Sustainable Procurement Policy and Strategy
- 2. Supplier screening and monitoring against ESG criteria
- Supplier selection and requisitions based on ESG considerations, such as inclusive criteria and criteria for selecting and onboarding local suppliers
- 4. Contract management in line with CBA's ESG commitments
- 5. Partnerships with Strategic Suppliers to codevelop sustainable solutions
- 6. Supplier Development
- 7. Sustainable Procurement Engagement and Communications

Our ambition: become a reference in sustainable supply chain management



# **Closing Remarks**

Qcba

# **Ricardo Carvalho**



## **CBA is well positioned to compete and capitalize on opportunities**

**Positive fundamentals** in the aluminum market

Vertically integrated operations with **100% renewable** power generation capacity A low-carbon aluminum producer, positioned in the 1<sup>st</sup> quartile of the global cost curve

Leadership in our main consumer segments, with higher-margin and value-added products A robust investment portfolio, aligned with strategic goals A management team with **solid industry expertise** that has led CBA's business and cultural transformation in recent years

