Vale's decarbonization strategy

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Brazil-Japan Business Council, July 2023

VALE

Roadmap

1. Mining throughout history
2. Vale's strategy to boost decarbonization
3. Vale and the Amazon
4. Partnerships with Japanese companies


Mining throughout history
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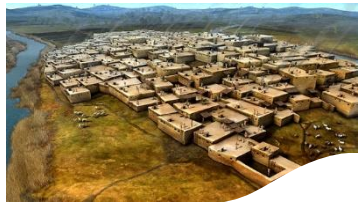
Mining throughout history

Copper Age

Copper was probably the 1st metal mined and worked. It was originally obtained as a native mineral and later by smelting ores.

6.000BC. – 3.500BC.



Copper objects from 6000 BC. were found in Çatal Höyük, Anatolia, Turkey.

3.500BC. – 1.500BC.

Bronze Age

After a few thousand years, prehistoric man began to produce a more resistant metal: bronze. It was used as raw material for making helmets, hammers, spears, axes, knives and other objects.

Iron Age

Iron replaced bronze as a more abundant material with greater durability. The Iron Age ended when writing became widespread. Even so, iron continued to be the most important metal until the 19th century.

1.500BC. – 400AD.

Iron weapons

Colonization routes

400AD. – 1.453AD.

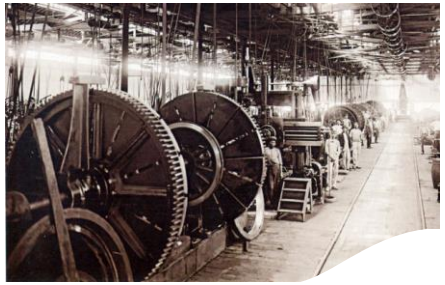
Middle Age

The search for minerals and precious stones in the 16th and 17th centuries played a key role in the exploration and colonization.

Modern Age

First Industrial Revolution: Mining, especially coal and iron, was the central axis for the progress of industrial technology. The application of pumps and steam engines was the first step towards the steel industry, with the replacement of firewood by coal.

1.453AD. – 1.789AD.



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Mining throughout history

Contemporary Age

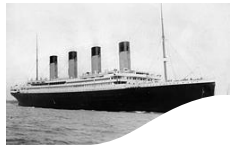
During the Second Industrial Revolution (1860–1914) a number of developments have occurred within the chemical, electrical, petroleum and steel industries. Other key developments in this period include the introduction of steam-powered steel ships, the development of the airplane, mass production of consumer goods, food canning, mechanical refrigeration and other preservation techniques, and the invention of the electromagnetic telephone.

1.789AD. – At present

Decarbonizing ironmaking will be transformational for the company and industry.

The climate emergency will be the greatest engine of mining growth, bringing multiple opportunities

Decarbonization and energy transition revolution



The Third Industrial Revolution began in the post-World War II period. It comprises the moment of greatest technological advancement, which began to cover not only the productive system but also turned to the scientific field, transforming social relations and the day-to-day of society.

Vale’s strategy to boost decarbonization

Strengthening our strategy for Vale of the future

We exist to improve lives and transform the future, together

promote

sustainable mining

- People-driven
- Reliable operator
- Benchmark in dam safety and management
- Shared value
- Nature positive

foster

low carbon solutions

- Focused on high quality products and resources
- Steel industry solutions
- Materials for the energy transition
- Circular mining

stay

disciplined

- Efficient capital allocation
- Attractive cash return for investors
- Solid balance
- Capex and cost efficiency

Vale has made **bold commitments** to mitigate climate change

Our environmental goals

- Reduce scope 1 and 2 emissions by 33% by 2030
- Neutrality of scope 1 and 2 emissions by 2050
- Reduce Scope 3 net emissions by 15% by 2035
- 100% renewable energy: Brazil (2025), globally (2030)
- Forests: recover and protect +500,000 ha (2030)
- Fresh water: reduce withdrawal by 10% (2030)

We protect ~1,191,000 ha and +600 endangered species of fauna and flora, 15% of all endangered species in Brazil

12 times larger than the total area utilized by our operations

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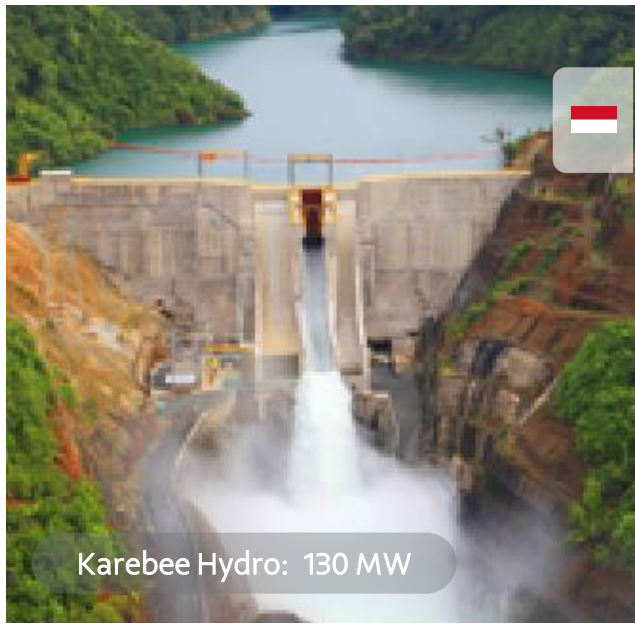
We have a **robust portfolio of renewables** built over the years to serve our operations

2,7GW
Installed capacity

99,95%
Renewable Generation Brazil

61%
Global self production



Sol do Cerrado Project

Jaíba, Minas Gerais

Equivalent to the consumption of a city of 800,000 inhabitants

Around 3,000 jobs, almost 50% of which local labor and 16% women

Reduce emissions by 134,000 tCO_2e/year, approximately 100,000 compact cars

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Iron ore briquettes **to boost the decarbonization** of the steel industry

Breakthrough technology developed in-house

- Decades of experience developing agglomerates
- Technology patent in 47 countries*

Reduction of CO_2 emissions

- 10% of reduction to BF-BOF Route **
- 80% less emission in the direct reduction route when compared to the pelletizing process***

Plants in construction

- 7 Mta of capacity in 3 plants being converted
- Potential to reach up to 50 Mta

*** Patented or in submission process. ** Considering substitution of sintering. *** Considering scope 1 and 2. Briquetting process also has 99% less SOx, 75% less NOx and 20% less particulates emissions than pelletizing process.**

Co-products: recycling dry tailings to sustainably increase production capacity

Ore-sand: recycling dry tailings to contribute to circular economy

- Less area required to dispose dry tailings[1]
- Co-products operations in place at Brucutu and plans for Viga in 2022[2]
- Sand as a raw material for industry (around 1.0 Mt sales[3] committed to 2022)
- Multiple uses under development (e.g. bricks, green tires, quartz)
- Circular economy: shared value with communities[4]

[1] Tailings from current production. [2] Operations in Itabira and Vargem Grande are under analysis for the future. [3] Sales and donations. [4] As an example, the creation of local industries and jobs creation.

Sand stockpile Brucutu site

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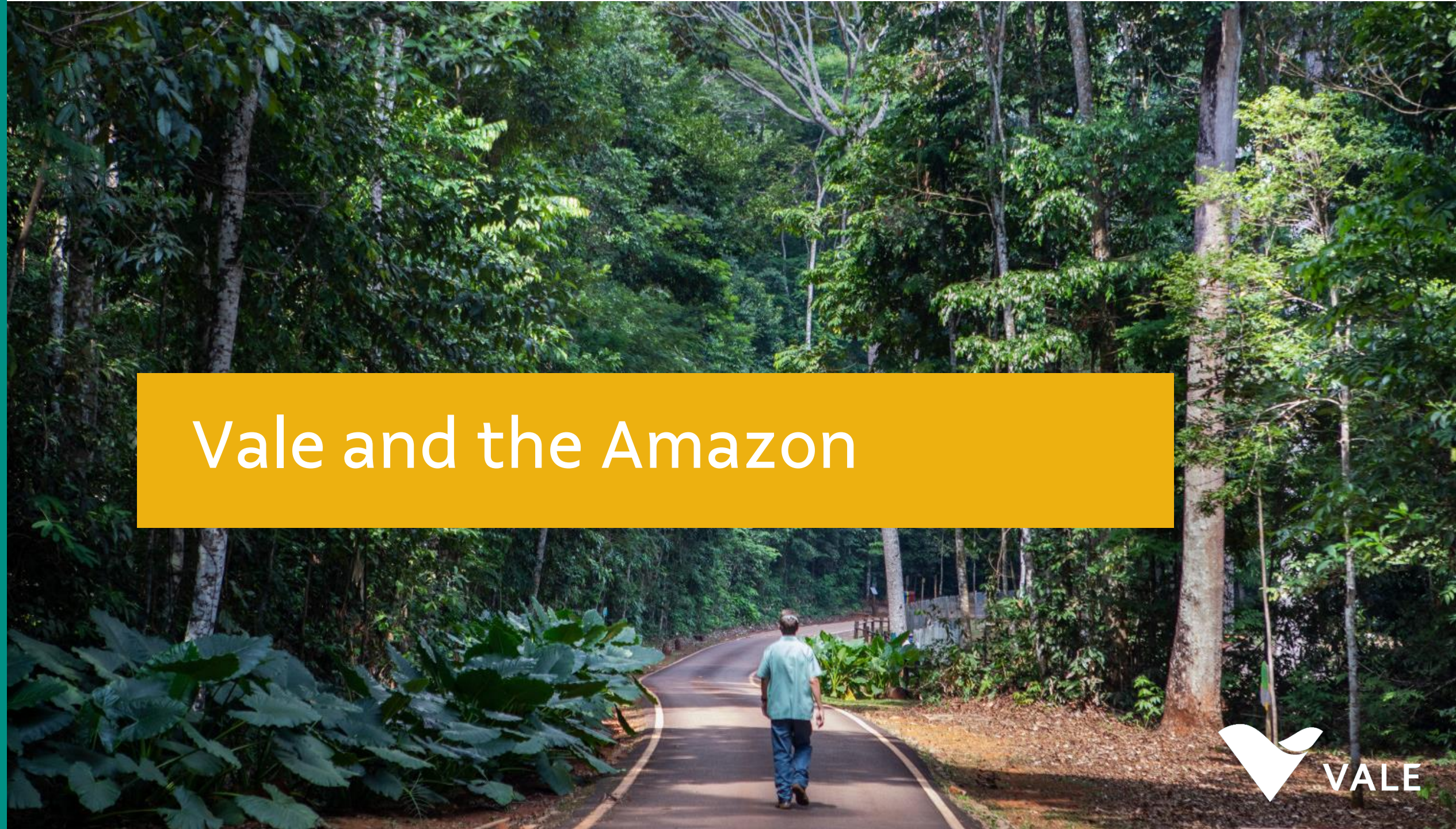
Vale and the Amazon
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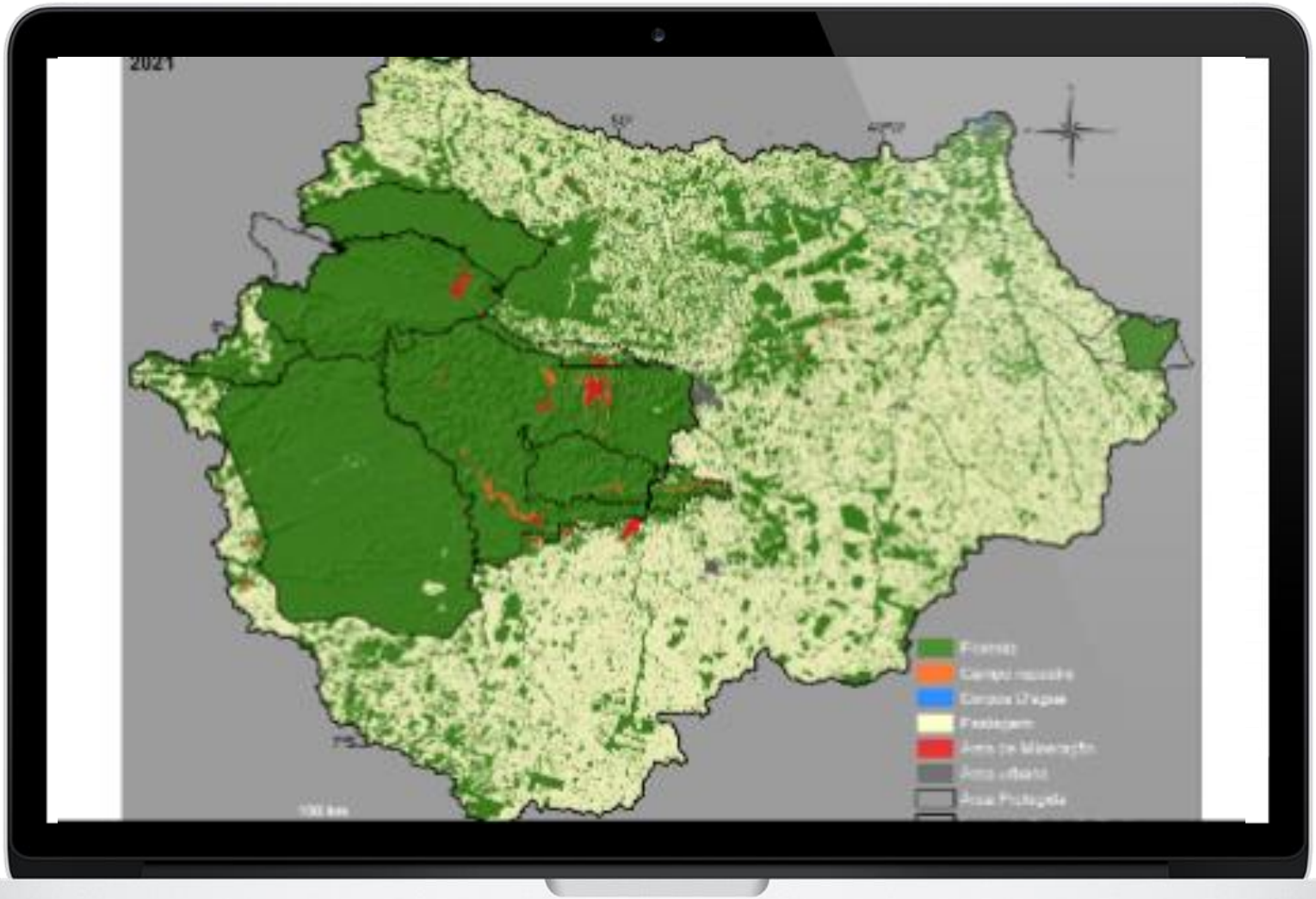
Carajás is a world benchmark in **sustainable mining**



Carajás

Our mines utilize only 2% of the area, but represent 60% of our production

The remaining 98% of the area is protected in partnership with ICMBio and Ibama

The iron ore in Carajás averages 67% Fe content (the highest on the planet)

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Carajás is a world benchmark in **sustainable mining**

~1,191,000 ha protect and +600 endangered species of fauna and flora, 15% of all endangered species in Brazil

Driving partnerships to go beyond our goal:

- **Biomes Initiative**
- **PrevisIA**
- **Supporting startups**

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Advancing protection and **sustainability in the Amazon**

- **Fundo Vale and Grupo Algar,** through Algar Farming, **sign an agreement to protect the Amazon Rainforest in Pará.**
- **The initiative will generate first purchase of high-integrity forest carbon credits by Vale.**
- The agreement, which will run until 2030, governs Vale's purchase of around 133,000 credits, made at the end of 2022, which is equivalent to protecting approximately 50,000 hectares of forest.
- One carbon credit = One ton of carbon dioxide equivalent (tCO2e).

OUR 2030 SOCIAL GOALS

Self-sufficient communities
Lift 500,000 people
out of extreme poverty

Indigenous Peoples
Indigenous communities neighboring Vale's operations with UNDRIP land rights plans

Sustainable Mining
Rank among TOP 3 in the social requirements, per the main external assessments

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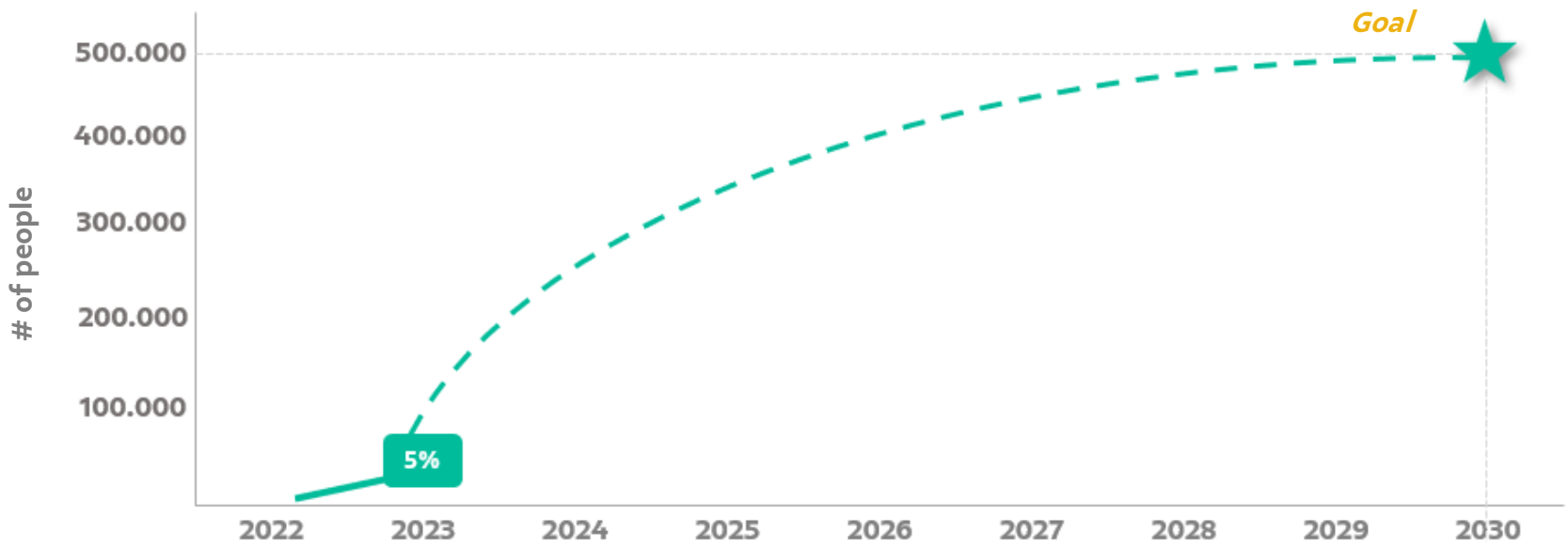
Fighting poverty is essential for communities and resilience of our business

Multidimensional approach to lift 500,000 people out of extreme poverty



- Education
- Health and Nutrition
- Income generation
- Infrastructure

Supported by partnerships

Partnership with Japanese companies

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Partnerships with Japanese clients

- Vale is **committed** to contribute with its steelmaking clients in this challenge of reducing carbon footprint; in line with our strategic pillar – **New Pact with Society** – and the goal of improving our value to society.
- Vale has memorandum of understandings to develop studies in **decarbonization technologies and products** with all Japanese steel mills.
- Partnerships aligned with the Japanese Government **2030 and 2050 net zero emissions target.**

NIPPON STEEL

Nippon Steel Corporation and Vale Sign Memorandum Regarding Decarbonization Solution

Apr. 26, 2022

Nippon Steel Corporation

Nippon Steel Corporation (hereinafter, "Nippon Steel") and Vale S.A. (headquarters: Rio de Janeiro, Brazil; CEO: Eduardo Bartolomeo; hereinafter, "Vale"), one of the world's foremost mineral resource companies, have signed a memorandum for the purpose of strengthening their relationship and considering and discussing specific strategies, with the aim of realizing carbon neutral steelmaking processes.

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7/13/2020

Vale informs on non-binding heads of agreement with Kobe Steel and Mitsui & Co.

Vale informs that it has reached a non-binding heads of agreement to establish a new venture (NewVen) to supply low GHG (greenhouse gases) metallics and steel making solutions to the steel industry with Kobe Steel, Ltd and Mitsui & Co., Ltd.

NewVen with the objective of delivering low CO2 metallics to the global market, providing new technological solutions to our clients. An evaluation period has already begun to deepen the cooperation and to gauge market demand for several existing and new steel making solutions prior to a final agreement for the creation of the NewVen.

Our declared 2030 targets for scope 1 and 2 emissions demonstrate Vale's commitment with the Paris Agreement, in line with our strategic pillar - New Pact with Society - and the goal of improving our value to society. Steel production, part of Vale's scope 3, while essential for people's daily lives, generates considerable CO2 emissions. Vale is committed to contribute with its steelmaking clients in this challenge of reducing carbon footprint. The NewVen will use existing and new low-CO2 iron making technology such as Tecnored® Technology and Midrex® Process.


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