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## Vale presents successful experiences in reducing carbon emissions and restoring forests at COP 27

*At the UN Climate Conference in Egypt, the company will show what it has been doing to become net zero by 2050 and it will present a tool that monitors physical and financial risks to its operations related to climate change.*



Vale has selected some successful initiatives involving decarbonization, forest restoration and mitigation of climate change impacts, developed over the last few years, to present at the panel discussions and business meetings of the UN Climate Change Conference, COP 27, which is taking place between November 6 and 18 in Sharm El Sheikh, Egypt. These initiatives include an unparalleled study by the Vale Institute of Technology – Sustainable Development (ITV-DS), which aims to increase soil carbon stocks through forest restoration, thereby helping reduce greenhouse gas emissions.

The company will also present the latest results of its PowerShift program, designed to seek innovative solutions to replace fossil fuels with clean sources in mine and railroad operations. Regarding initiatives to cut value chain emissions (Scope 3), Vale will present the latest advances involving its partnerships with steelmaking clients. In the space of two years, the company signed contracts for decarbonization solutions with more than 30 clients, representing around 50% of its Scope 3 emissions.

The Vale Climate Forecast will also be presented. This is a unique tool developed by the company, which makes it possible to identify climate change's potential operational and financial impacts in the short and long term.

In 2019, Vale announced the goal of reducing its carbon emissions under its responsibility (scopes 1 and 2) by 33% by 2030, as a first step toward zeroing its net emissions by 2050, in line with the Paris Agreement. In addition, it has pledged to reduce its Scope 3 net emissions by 15% by 2035. This target will be reviewed every five years. Today, 98% of Vale's CO<sub>2</sub> emissions come from its value chain.

Here is more information about some of the company's initiatives to reduce its emissions and its voluntary support for actions on the climate agenda:

**Reduction in scope 1 and 2 net greenhouse gas emissions** – In 2020, Vale announced the goal of zeroing its scope 1 and 2 net greenhouse gas emissions by 2050. At COP 27, the company will present the measures it has taken to achieve this goal, including PowerShift. Created in 2018, this program aims to replace fossil fuels with clean sources in operations, focusing on the use of renewable energy and alternative fuels, as well as greater operational efficiency through new technologies. For example, as part of its asset electrification strategy, Vale has adopted two battery-powered switcher locomotives at its ports in Vitória and São Luís, and two 72-ton electric trucks in its mining operations in Indonesia and Minas Gerais, Brazil. The company is also using around 50 battery-powered underground mine machines in Canada.

**Steelmaking decarbonization** – Vale is one of the world's largest iron ore suppliers and the steel industry is its main customer. The carbon-intensive mining and steel sectors together account for around 15% of global emissions, according to a study by consulting firm McKinsey. Vale's Scope 3 emissions, meaning those related to its value chain (suppliers and steel clients), account for 98% of the company's total emissions. In 2020, the company announced the goal of cutting its Scope 3 emissions by 15% by 2035.

At COP 27, Vale will present a case study on the impact of methane leakage on low-carbon steel production strategies. The company will also describe what it has done to help decarbonize the steel industry by introducing steel production solutions that include high-quality iron ore, green metallic briquettes, alternative production routes and other initiatives. So far, Vale has entered into partnerships aimed at decarbonization solutions with more than 30 clients, which represent around 50% of its Scope 3 emissions.

The company recently announced agreements with Saudi Arabia, the United Arab Emirates and the Sultanate of Oman to create mega hubs for the production of hot briquetted iron (HBI) and high-quality steel products using green briquettes. HBI will be produced in direct reduction furnaces powered by natural gas. It is estimated that this will cut carbon emissions by approximately 60% compared to traditional integrated blast furnaces and basic oxygen furnaces, which use coke and metallurgical coal.

**Monitoring of physical risks related to climate change** – Vale constantly monitors its assets in Brazil and worldwide to reduce physical risks related to climate change. At COP 27, the company will present a methodology developed with the support of ITV to manage physical risks related to climate change, called the Vale Climate Forecast. This tool makes it possible to identify potential short and long-term operational and financial impacts due to climate variables such as changes in rainfall regimes and volumes and temperature variations across all the company's operations. Long-term analyzes have already been carried out for Vale's operations in Canada and in northern and northeastern Brazil. The company's other locations will be studied in due course. In addition, in relation to monitoring, a pilot project was run at Ponta da Madeira Maritime Terminal in São Luís, Maranhão, which involved sharing daily precipitation forecasts with the entire port. This information helps decision making for embarkation and distribution operations involving iron ore and other products, optimizing plans and minimizing risks.

**Forest restoration** – Researchers from the Vale Institute of Technology – Sustainable Development (ITV-DS) in Belém developed a technique to aid forest restoration while enhancing carbon capture from the atmosphere to soil. A research study resulted in a solution that makes it possible to identify molecular markers capable of quantifying genes and proteins that enhance management practices and thereby help conserve carbon in organic form, reducing greenhouse gas emissions. Data from the UN Intergovernmental Panel on Climate Change (IPCC) shows that soil may account for up to 70% of the carbon stored in the ground in the form of organic matter. This is almost three times more than the amount stored in vegetation and around twice as much as is in the atmosphere.

Using the technique developed by ITV, the soil can become healthy and productive once more by accumulating organic matter in just four years. It will then be possible to measure the amount of carbon stored in the soil, enabling farmers to sell carbon credits.

**2030 Forest Goal** – In 2019, Vale committed to voluntarily protecting and restoring another 500,000 hectares of forests in Brazil by 2030. Of this total, 100,000 hectares will be restored and another 400,000 will be protected. Since then, more than 6,000 hectares have been restored through investments in five agroforestry businesses with positive social and environmental impacts and agreements have been signed with seven conservation areas, protecting 115,000 hectares. Fundo Vale is tasked with leading and implementing this goal's initiatives, in partnership with other Vale organizations such as Vale Natural Reserve and ITV.

The case of Caaporã, one of the businesses Fundo Vale has invested in, will be presented. The business has launched a line of dairy products, including milk, cheese and fermented products, with zero-carbon certification. These products are grouped under the NoCarbon brand. All greenhouse gas emissions generated in production are accounted for and compensated through the planting of native trees in agroforestry systems. In this model, deforested areas are restored through a combination of tree planting and cattle raising. The methane emissions produced by livestock are also offset.

The goal of 500,000 hectares is on top of the more than 1 million hectares that Vale already helps protect around the world through compensatory or voluntary initiatives. Of this total, 800,000 hectares are in the Amazon, where the company has been present for almost 40 years. This area, five times the size of London, is made up of six conservation areas, together forming the "Carajás Mosaic," which the company helps protect in partnership with ICMBio, a federal environmental agency. More than 60% of Vale's iron ore output comes from there, but its operational activities occupy less than 2% of the mosaic's total area, showing that it is possible to carry out sustainable mining.

**Deforestation forecasting** – In 2021, the Institute for the Amazon's People and Environment (Imazon), financed by Fundo Vale and Microsoft, launched PrevisiA, an artificial intelligence platform that predicts which locations in the Amazon have the highest risk of deforestation and fires. The tool analyzes a variety of data, such as topography, land cover, urban infrastructure, legal and illegal roads, and socioeconomic indicators, to identify possible trends in land use changes. The data is made available to public bodies for preventive actions to combat and control deforestation, and to the financial sector and agribusiness, in order to mitigate the risks of investments and market transactions associated with illegal deforestation.

**Biodiversity** – Vale has been investing in research and development to understand the Amazon biome's biodiversity through the Vale Institute of Technology – Sustainable Development (ITV-DS). In the last 11 years, ITV-DS has invested US\$141 million and supported 154 projects. The institute has so far mapped the genes of 9,500 plant specimens and 3,500 animal specimens (producing "DNA bar codes"). As a result, the area of rocky outcrops in the Amazon is the only Brazilian biome to have a genetic database of flora.

[More information](#)





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