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Vale announces 'green briquette' capable of reducing CO2 emissions of steelmaking clients by up to 10%

New product is able to replace sintering, a coal-intensive stage, thereby reducing emissions of gases and particulates

Vale has launched today (9/9), during a virtual meeting with market analysts, a new product that has been under development for almost 20 years and that will be able to reduce by up to 10% greenhouse gases emissions (GHG) during production processes used by its steelmaking clients. The “green briquette” is made of iron ore and an agglomerant technological solution, which can be obtained with the use of sand provided by the treatment of mine tailings, and is capable of resisting elevated blast furnace temperatures without disintegrating. The reduction of GHG emissions occurs because this product allows steelmakers to reduce their dependency on sintering, a process that takes place before steel production in which sinter feed is agglomerated.

Sintering requires the intensive use of coal heated to a temperature of 1300^{o}C. Vale’s briquette, however, is considered to be cold-agglomerated. In its production there is no burning, but rather a drying process at a temperature between 200 and 250^{o}C, requiring less energy. The product also reduces emissions of particulates and gases such as sulphur dioxide (SOX) and nitrogen oxide (NOX), as well as eliminates the use of water in its production.

The “green briquette” is part of Vale’s strategy to reduce by 15% Scope 3 emissions, related to its value chain, by 2035. In absolute terms, the commitment to reductions is equal to 90 million tonnes of carbon dioxide equivalent (MtCO2e), the same as the total volume of Chile’s energy emissions in 2018, the base year used for Scope 3 targets[1]. Today 98% of Vale’s total emissions are related to its chain of suppliers and clients.

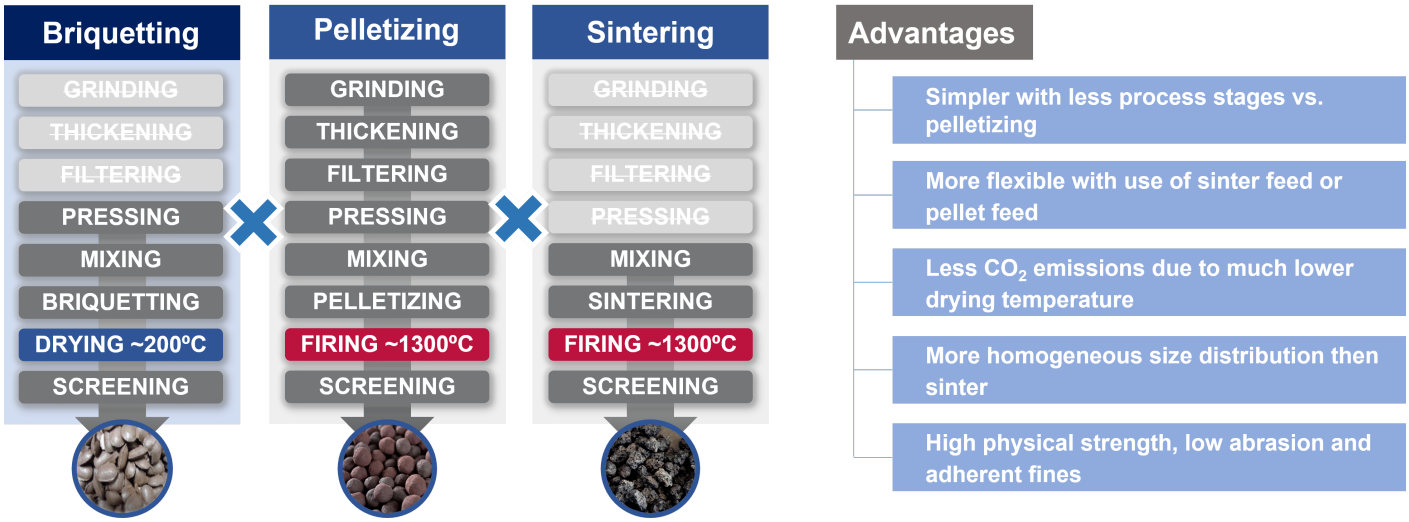

Figure shows the advantages of briquetting over pelletizing and sintering

“The ‘green briquette’ is part of the revolutionary line of iron ore products offered by Vale throughout its history, as the result of significant investment in research and innovation. Up until the 1960s, our basic product was lump, that has high iron content. As lump offer declined, we installed the first pelletizing plants in Brazil, which allowed for the use of pellet feed and continue to be important for the steelmaking production chain. Now we have the “green briquette”, which will revolutionize the steel production process,” explains Marcello Spinelli, Executive Vice-President, Iron Ore.

The production of “green briquette” will initially be carried out in pelletizing plants 1 and 2 at Tubarão Unit in Vitória (in Espírito Santo, Brazil), which are being converted for these purposes, and also in the Vargem Grande Complex, in Minas Gerais, in which a new plant is being installed. The initial production capacity will be approximately 7 million tonnes per year. The operations start up for the three plants is estimated for 2023. The total investment is US$ 185 million. Long-term estimates are that the company will have the capacity to produce more than 50 million tonnes of “green briquette” per year[2] , resulting in a potential reduction in emissions of 6 million tonnes of carbon dioxide equivalent per year (MtCo2e/ano) through the use of this technology.

Iron ore briquettes stockpile: new product will be produced in plants in Espírito Santo and Minas Gerais, with a total capacity of 7 million tons per year

The new product began to be developed in 2004 by researchers at Vale’s former Ferrous Metals Technology Department at Vitória. In 2008, that department was incorporated to the Ferrous Metals Technology Centre (CTF) in Nova Lima (Minas Gerais), where the studies on briquette went on. The CTF is a high-level research centre whose purpose is to develop products that improve the performance of industrial processes for Vale’s steelmaking clients.
The briquette’s initial industrial testing took place at a charcoal-burning furnace in 2019. Testing in large-scale coke furnace began in 2020. “As results were satisfactory, we considered ourselves ready to begin construction of the first plants in order to commercially launch the product,” affirmed Rogerio Nogueira, Marketing Director, Iron Ore.

Since Vale announced its Scope 3 targets, the company has been creating a roadmap with steelmaking clients in order to discuss partnerships for decarbonization projects. On August 19th, Vale and Ternium signed a Memorandum of Understanding (MoU) in which both companies agree to develop economic feasibility studies of potential investment in a green briquette plant located at Ternium Brasil facility.

As part of its plan to reach Scope 3 targets, Vale is also investing in the concentration of Fines Dry Magnetic Separation (FDMS) and in sustainable solutions for steel production inputs for both electric furnaces and conventional blast furnaces used in steelmaking.

Net Zero

The target for reducing Scope 3 emissions is part of Vale's strategy to eliminate its net direct and indirect carbon emissions (Scopes 1 and 2) by 2050. As part of these initiatives, the company will invest between US$ 4 and 6 billion towards reducing these emissions by 33% by 2030. To date, this is the largest investment in fighting climate change that has been committed to in the mining industry. Residual emissions will be neutralized through compensation mechanisms. All of Vale's targets for reducing emissions are in line with the Paris Agreement's goal of limiting global warming to below 2ºC up until the end of the century.

[1] *Data for Chile's energy emissions are from the International Energy Agency.*

[2] *Estimates are subject to confirmation through viability studies, internal approvals of new projects and market conditions.*

More information

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