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Vale cuts emissions and water use at S11D Project

One of the distinctive features of the Carajás S11D Iron Project in Canaã dos Carajás, Pará, Brazil, is its replacement of off-highway trucks, commonly used in mining, for a system composed of excavators and mobile crushers. Accordingly, the ore will be transported along mobile rubber conveyor belts extending up to 9 km between the extraction site and the processing plant. Using this innovative solution, Vale will reduce the environmental impact of mining iron ore.

Carajás S11D Iron Project - A new impetus to Brazil's sustainable development

At a conventional mine of this size, 100 off-highway trucks would be required. Using the “truckless” system, Vale will reduce its diesel consumption by 77% and its annual CO2 emissions will fall from 146,300 to 33,700 metric tons – again, a 77% decline. This reduction is equivalent to the emissions of 75,000 small cars.

In all, 37 km of conveyor belts will be installed within the mining area, including branches that will connect to the main trunk line to the processing plant. The maximum distance between the ore collection point and plant will be 15 km. The system will feature excavators to collect material in the mine and throw it into mobile crushers that will in turn feed the belts. Between the plateau where the ore will be extracted and the site where the processing plant will be built, there is a difference of altitude of 450 meters. This is another advantage of the truckless system, as conveyor belts can cope with this slope more easily than trucks, which would have to zigzag to reach the destination, thereby increasing the area of forest affected.

In addition, using conveyor belts will enable the processing plant to be built on pasture land outside the forest where the mine is located, reducing the deforestation impact. S11D's ore processing plant will also use a type of processing developed by Vale that cuts water consumption by 93%, the equivalent volume used by a city of 400,000 inhabitants. By processing the ore using its own natural moisture, as already happens at the N4 and N5 mines in Carajás, water consumption will be 110,000 m3 per month rather than the nearly 1.7 million m3 per month that would be used in a conventional plant.

S11D's main machinery will be powered by electricity. Only crawler tractors, motor graders and other auxiliary machines will continue to run on diesel. Vale plans to use “B20” biodiesel to run this equipment, reducing greenhouse gas emissions further and complying in advance with legislation that mandates the use of this fuel as of 2020.

Another innovation in the project is the use of equipment manufactured and installed in modules, a concept already used in the oil industry to build offshore platforms. Modularization will reduce the social impact on the region, as it will avoid the need for large numbers of workers to be present during S11D's implementation phase.

More information 



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