



## News Release

# Vale and Midrex to Cooperate for Use of Iron Ore Briquettes in Direct Reduction Plants

**Pineville, North Carolina, USA (September 4, 2024)** – Vale and Midrex Technologies, Inc. have agreed to cooperate in advancing a technical solution for the use of iron ore briquettes in direct reduction plants. Executives of the two companies met at the Midrex Research & Technology Development Center and signed a Technical Cooperation Agreement, united by a common vision for steelmaking decarbonization.

The agreement extends the parties' technical cooperation and test work developed over the last year. Vale's proprietary briquetting technology enables the production of high-quality iron ore agglomerates from the low-temperature process using a technological solution of binders, which gives the final product high mechanical strength.

Initial test results have shown promising results in using iron ore briquettes in the direct reduction process. Once the technology has been successfully demonstrated in MIDREX® Plants, both partners plan to evaluate the creation of a joint venture to exclusively provide briquette technology and facilities to the market.

Currently, most direct reduction plants use iron ore pellets as a feedstock. Vale's briquette production process represents an alternative to the pelletizing process with lower production costs, lower investment intensity, and approximately 80% less CO<sub>2</sub> emission.

Through direct reduction technology, Direct Reduction Iron (DRI) is produced. DRI is a critical feedstock to produce high-quality steel with fewer impurities in Electric Arc Furnaces (EAFs). DRI can also be used in Blast Furnaces (BFs) to supplement and replace iron ore, reducing the need for coke and carbon emissions.

Direct reduction technology has a lower CO<sub>2</sub> footprint compared to other ironmaking processes, as it uses natural gas as the reduction agent instead of coke – an input obtained from mineral coal. Using green hydrogen instead of natural gas enables the production of green steel with near-zero GHG emissions.

“This agreement is a recognition by one of the world's leading suppliers of direct reduction technology of the briquette's strong potential to decarbonize the global steel industry,” said Vale's

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CEO Eduardo Bartolomeo. “More than a technical cooperation agreement, it is the start of a partnership that will play a crucial role in scaling briquette technology to several markets.”

“We are very excited to be working with Vale to find a cost-effective and environmentally friendly solution for using iron ore fines in DR Plants,” KC Woody, Midrex President & CEO, said. “And the ability to convert DRI fines and other waste streams into a saleable product presents an even greater opportunity.”



Iron ore briquettes

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Eduardo Bartolomeo, CEO of Vale, and KC Woody, President & CEO of Midrex Technologies, Inc.

### **Midrex Technologies, Inc.**

Midrex is the world leader for direct reduction ironmaking technology and aftermarket solutions for the steel industry. As developer of the MIDREX® Process, Midrex has designed, built, and serviced direct reduced iron (DRI) plants for 50-plus years. MIDREX Plants produce approximately 80% of the world's low CO<sub>2</sub> DRI.

The MIDREX Process is highly flexible in reductant sources, iron oxide feed, and product discharge options. Plants can be configured to operate on natural gas, natural gas with hydrogen addition (MIDREX Flex®), and 100% hydrogen (MIDREX H<sub>2</sub>™). Iron oxide pellets and lump ores, regardless of their Fe content, can be transformed into either cold DRI (CDRI), hot DRI (HDRI),



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or hot briquetted iron (HBI). Plants can be designed for cold and hot discharge at the operator's discretion, and proven options are available for transporting and charging HDRI into an EAF.

For more information, please visit [www.midrex.com](http://www.midrex.com).

### Vale

Vale is a global mining company that exists to improve lives and transform the future together. One of the world's largest producers of iron ore and nickel and a major copper producer, Vale is headquartered in Brazil and operates around the world. Its operations comprise integrated logistics systems, including approximately 2,000 kilometres of railways, marine terminals and 10 ports distributed around the globe. Vale has the ambition to be recognized by society as a benchmark in safety, the best-in-class reliable operator, a talent-driven organization, a leader in sustainable mining, and a benchmark in creating and sharing value.

For more information, visit <https://vale.com>.

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