PRIMETALS TECHNOLOGIES

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SAIL Bokaro Advances Green Steelmaking with Hydrogen Injection System from Primetals Technologies

- **Pioneering decarbonization in Indian blast furnace operations**
- **Enabling practical emission reduction through hydrogen innovation**
- **Improving blast furnace permeability and process efficiency**

Steel Authority of India Limited (SAIL) Bokaro Steel Plant has partnered with Primetals Technologies for the engineering phase of a hydrogen gas injection system for a blast furnace at its facility in Bokaro Steel City, Jharkhand. Funded by the Indian government under a carbon reduction scheme, this initiative aims to achieve measurable emission reductions and supports SAIL's broader environmental goals.

Replacing Conventional Fuels with Hydrogen

The project centers on integrating hydrogen gas injection technology at the blast furnace tuyere level. Primetals Technologies will engineer the hydrogen injection system where hydrogen gas will partially replace conventional fuels, directly reducing CO_2 emissions from ironmaking. The phased introduction of hydrogen enables controlled adaptation and optimization, addressing the technical challenges of replacing traditional carbon-based fuels. This approach not only reduces CO_2 emissions but also improves blast furnace permeability and process efficiency.

Decarbonization in Large-Scale Steelmaking

SAIL Bokaro's investment is part of its comprehensive sustainability strategy, which includes advanced emission controls, efficient waste management, and green initiatives such as the development of green belts and afforestation programs. By adopting hydrogen-based solutions, SAIL Bokaro aims to set an industry benchmark, demonstrating the practical benefits of decarbonization in large-scale steel production.

Hydrogen Gas Injection

Gas injection at the tuyere is increasing in popularity as steelmakers globally seek CO_2 emission reduction. Hydrogen and hydrogen-bearing gases offer a practical way to replace part of the traditional carbonaceous fuels, thereby lowering furnace emissions.

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Primetals Technologies has provided design solutions for gas injection at the tuyeres for over 40 years and, in recent years, has established engineering expertise for these systems within India. This has included a trial hydrogen injection plant and full-scale synthesis gas injection plants at other major steelmakers.

Key Facts: A Long-Standing Partnership

Primetals Technologies and SAIL have a long history of collaboration across multiple projects. Recent highlights include:

- Modernization of automation systems at the finishing mill of SAIL Bokaro's hot strip mill, successfully completed ahead of schedule at the end of 2024.
- Installation of a fourth Hot Blast Stove at the IISCO plant (currently under construction).
- Installation of a fourth Hot Blast Stove at the RSP plant (currently under construction).
- Installation of a secondary emission control plant at the Steel Melt Shop of SAIL Bokaro (currently under construction).
- A memorandum of understanding (MoU) with SAIL to closely collaborate on decarbonization projects and technologies for the RSP plant.

Contract signing with representatives from SAIL and Primetals Tecnologies at SAIL's Research and Development Centre for Iron and Steel (RDCIS), Ranchi, Jharkand, India.

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