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Implementation of EASyMelt with Ammonia and HBI Charging to Achieve Ultra Low Carbon Ironmaking

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Despite being the largest emitter of CO2 in the steel industry, the blast furnace (BF) process remains dominant due to its high productivity, cost-effectiveness and flexibility in ore usage. Still, with the proliferation of policies geared towards curbing CO2 emissions, the BF process must transition towards operation with lower emissions. In that context, Paul Wurth S.A. has unveiled EASyMelt, a technology to reduce CO2 of the blast furnace in a stepwise approach. If EASyMelt has a high flexibility in energy inputs, ammonia and Hot Briquetted Iron (HBI) are of particular interest due to their potential to relocate energy consuming steps. Indeed, they are both storable, transportable and can be produced in regions with good availability of renewable energy. In this study, the implementation of the EASyMelt concept with ammonia and Hot Briquetted Iron is evaluated using a newly developed numerical simulation model. In addition to the potential coke and CO2 savings, the impact on the furnace's internal state is investigated. A particular focus is given to the furnace permeability, the thermal and chemical behaviors, as well as the cohesive zone characteristics.

Primary author: Mr MAURET, Florent (SMS group)

Co-authors: Dr BANIASADI, Mehdi (SMS group); Dr KINZEL, Peter (SMS group); Prof. SAXÉN, Henrik (Åbo Akademi University)

Presenter: Mr MAURET, Florent (SMS group)

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