Contribution ID: **241** Type: **Keynote Presentation**

Comparison of laboratory tests and HKM blast furnaces on the reduction and carburisation behaviour of burden materials under coke gas injection

Wednesday 8 October 2025 11:30 (20 minutes)

Keywords: CO2 reduction, Blast Furnace, Coke Oven Gas, Green steel, Hydrogen containing injectants, Iron oxide reduction

By developing decarbonisation plans, the European steel industry shows its commitment to the European climate change targets. The main element in these plans is a transformation step involving a transition from carbon-based blast furnaces to green hydrogen-based direct reduction processes. This will take place around 2030 and will result in significant CO2 reductions.Hüttenwerke Krupp Mannesmann (HKM) has already taken measures to reduce CO2 emissions.

As already presented at the 8th and 9th ECIC in Bremen and Bardolino, HKM has upgraded its systems to inject compressed coke oven gas (COG) at the two blast furnaces "A"and "B". Since the injection station was commissioned in June 2023, HKM has been able to inject more than 250 million Nm^3 of hydrogen at a continuous injection rate up to 45 kg/tHM, saving more than 300.000 tonnes of CO2.

This article discusses the effect of COG on blast furnace burden materials. For this purpose, the effect of hydrogen-containing gases on the reduction and carburisation behaviour was investigated and compared in laboratory tests at the BFI in Düsseldorf. These results will be used to improve the understanding of the metallurgical process and the effect of coke oven gas on blast furnace performance. As a result, the use of coke oven gas can further contribute to the reduction of the CO2 footprint of HKM crude steel.

Primary author: Dr PERRET, Fabian (Hüttenwerke Krupp Mannesmann GmbH)

Co-authors: Dr JANZ, Andreas (Hüttenwerke Krupp Mannesmann GmbH); Mr EFETUERK, Mohamed; Dr PETER, Rosa (Hüttenwerke Krupp Mannesmann GmbH); Dr LICHTE, Marten (VDEh-Betriebsforschungsinstitut GmbH); Ms OVERBECK, Theresa (VDEh-Betriebsforschungsinstitut GmbH)

Presenter: Dr PERRET, Fabian (Hüttenwerke Krupp Mannesmann GmbH)

Session Classification: Burden Materials & Quality

Track Classification: Ironmaking - Blast furnace ironmaking