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BOF operation with increased scrap rate for CO_2-reduction

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The REDERS project, which stands for "Reduced CO_2 emissions by increased recycling ratio in steelmaking processes", is a joint project of the steel producers thyssenkrupp steel Europe (tkSE) and Hüttenwerke Krupp Mannesmann (HKM) together with the recycling company TSR and the research institute BFI, which is coordinating the entire project.
The aim of the project is to increase the proportion of recycled scrap in the production of iron and steel and at the same time reduce the CO_2 emissions of integrated steel mills. To this end, a new innovative recycling plant with advanced optical detection systems and a modern material management system has been developed, built and continuously improved.
The first industrial trials of the new high-quality recycling product have been carried out at HKM's industrial BOF. In the converter, oxygen is blown into pig iron from the blast furnace, mainly to reduce the carbon content, phosphorus and nitrogen. This process produces CO_2 and also a lot of heat due to exothermic reactions. Feeding steel scrap into the process for cooling purposes is already common practice in converter operations. Further substitution of blast furnace-based hot metal by increased use of recycled material leads to a reduction in CO_2 emissions. However, the increase in the recycling rate in the converter is limited, as the input materials have too high a content of tramp elements.
The presentation will give an overview of TSR's new innovative recycling plant and present the main results of the industrial trials with increased scrap rates at HKM's BOF. An outlook on further applications will also be given.

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