Contribution ID: **65** Type: **Keynote Presentation**

HIsarna –smelting reduction for a carbon neutral steel industry

Tuesday 12 May 2026 08:30 (20 minutes)

The HIsarna ironmaking process is a smelting reduction process under development at pilot scale at Tata Steel in IJmuiden, the Netherlands. The pilot trials have reached a stage where upscaling to an industrial scale can take place.
Over the past few years several significant upgrades were made to the pilot facility to improve operational stability and plant reliability to further explore the process window. To support the upscaling effort focus of the most recent trials has been on maximising productivity and widening the raw materials window. Work is also ongoing to minimise the total carbon footprint and achieve carbon neutral hot metal production.
A series of successful trials at high productivity has demonstrated the required process stability and energy efficiency to justify scaling up to an industrial scale plant. The current pilot plant has a name plate annual production capacity of 65 000 tons of hot metal. A first economically viable industrial scale facility would need to increase this with a factor 15 and be able to produce around 1 million tonnes of hot metal per annum.
Besides stable operation and a high productivity it is also important that the process can work with a range of raw materials. Over the past year several ore qualities, including lean ores, as well as coals and alternative carbon sources have been successfully tested.
As the HIsarna process uses pure oxygen instead of hot blast, the process gas consists of a concentrated CO2 stream which is very suitable for CO2 capture. At the same time effort is ongoing to try and fully replace fossil carbon input with sustainable fossil free alternatives.
This paper will discuss the latest results from the pilot plant trials, look at some of the criteria for up scaling and define the carbon footprint according to the LCA method.

Speaker Country

Netherlands

Speaker Company/University

Tata Steel IJmuiden

Primary author: VAN BOGGELEN, Johan (Tata Steel IJmuiden, Netherlands)

Co-authors: KUMAR, Ashok (Tata Steel UK Ltd./Swansea University); KLEEMANS, Carel (Tata Steel IJmuiden, Netherlands); FRADET, Jeanne (Tata Steel IJmuiden, Netherlands); MEIJER, Koen (Tata Steel R&D, Netherlands); VERBOON, Miranda (Tata Steel IJmuiden, Netherlands); PEETERS, Tim (Tata Steel R&D, Netherlands)

Presenter: VAN BOGGELEN, Johan (Tata Steel IJmuiden, Netherlands)

Session Classification: New and emergent ironmaking Technologies I

Track Classification: EMECR: EMECR 1. New and emergent ironmaking Technologies (hydrogen, biomass, electrolysis, etc.)