Contribution ID: **69** Type: **Oral Presentation**

# Valorisation of EAF dust by agglomeration and recycling back to process

*Tuesday 12 May 2026 14:00 (20 minutes)*

Steel industry is a major contributor to the global economy but generates significant amounts of residues. Most are valorised by internal recycling or external use. Significant amounts of carbon and iron units cannot be recycled because the zinc content in the dust and sludge is too high for steelmaking, yet too low and contaminated with impurities to be processed by zinc producers The landfill is a high-impact and high-cost solution, not economically sustainable. For the recycling of these residues in steelmaking processes, the removal of zinc is important since this element creates various problems in steel plants. About 30% of the EAF (electric arc furnace) dust cannot be recycled due to zinc content. The European project ZincVal (RFCS-02-2022-RPJ, 10111263) aims to develop technologies integrated with the steel production that enable recovery of iron, carbon and zinc from dust and sludge and avoid landfilling. The approach of using different technological routes, at relatively low starting TRL and with synergies between some of the approaches represents a significant and credible due diligence approach to both increasing the valorisation of low zinc-containing residues in current steelmaking practices and preparing for a significant increase in the availability of these in future steelmaking. Based on the properties of dusts and sludges, determined via physical, chemical and mineralogical characterization, the project will design the most sustainable recycling routes for different residues regarding environmental impact, energy consumption and CO2 emissions, as well as cost-effectiveness. The project approach for EAF dust is to test methods and design recipes for producing agglomerates in form of briquettes for recycling back into the EAF to enrich dust in zinc contents above the threshold set by zinc smelters. Experimental campaign conducted on laboratory scale will be presented. The goal of this experimental campaign is to identify the best recipe to produce briquettes that have acceptable mechanical strength and are compatible with melting operations in the electric arc furnace.

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**Session Classification:** Circularity and by-product management in the steel industry

**Track Classification:** EMECR: EMECR 4. Circularity and by-product management in steel industry