

Contribution ID: 20

Type: Oral Presentation

Secondary metallurgy challenges in the transformation from oxygen to electric steelmaking

Thursday 9 October 2025 11:40 (20 minutes)

The path to reducing steel's CO_2 footprint is increasingly clear, with the industry shifting toward electric arc furnace (EAF) steelmaking. This transition relies on recycled scrap and partially substitutes virgin materials with direct reduced iron (DRI) or hot briquetted iron (HBI). However, the changing quality of input materials, particularly the reduced purity of raw materials and variability in scrap, poses challenges for secondary metallurgy processes, including ladle refining furnaces, vacuum tank degassers, and RH recirculation degassers. Controlling and reducing sulfur, nitrogen, and tramp elements has become more complex under these conditions.

To address these issues, adjustments in steel refining practices are essential. This paper discusses revised processing routes, the installation of additional equipment, and the redesign of meltshop layouts to optimize operations with diverse and lower-quality feedstock. These measures are critical for maintaining product quality while aligning with the industry's push toward more sustainable practices.

By adapting processes and infrastructure, the steel industry can effectively manage the challenges associated with varying material inputs and achieve significant CO_2 emissions reductions. The paper provides insights into these adjustments, offering a framework for navigating the complexities of transitioning to environmentally sustainable EAF steel production.

Primary authors: Mr PEZZA, Andrea (Badische Stahl-Engineering); Dr FIRSBACH, Felix (Badische Stahl-Engineering); Dr LACHMUND, Helmut (Badische Stahl-Engineering); Mr POWELL, Matthew (Badische Stahl-Engineering)

Presenter: Mr PEZZA, Andrea (Badische Stahl-Engineering)

Session Classification: Process Transformation & Strategy

Track Classification: CO2 mitigation in iron and steelmaking