Contribution ID: **284** Type: **Oral Presentation**

Enhancing Steelmaking Waste Utilization through Electric Smelting Furnace Technology

Tuesday 7 October 2025 11:50 (20 minutes)

Steelmaking plants generate various waste materials, primarily slag, iron-containing fines, and sludges. Traditionally, many of the iron-bearing wastes have been recycled in integrated steel plants such as in sinter plants and blast furnaces. However, the shift to Electric Arc Furnaces (EAF) and stricter environmental regulations are diminishing the role of traditional recycling methods. As plants continue to generate up to 500 kg of waste per tonne of crude steel, and competition for high-grade iron ores intensifies, identifying sustainable applications for steelmaking waste is becoming increasingly critical.
Through effective reduction and fluxing strategies, the Electric Smelting Furnace (ESF) can convert iron-bearing wastes into hot metal for steelmaking, and slag suitable for the cement industry. In this process, waste materials serve as primary iron sources, while steelmaking slags can be used as fluxing agents and/or secondary iron sources. This study utilizes first-principle process models and industrial benchmarking to assess the ESF's effectiveness in enhancing iron recovery in steel plants, improving waste valorization, and offering a sustainable alternative to declining traditional steelmaking waste recycling methods.

Primary author: JOUBARANI, Kamal (Hatch Ltd.)

Co-authors: Dr GE, Sa (Hatch Ltd.); Mr GILBERTI, Gustavo (Hatch Ltd.); Mr WALKER, Christopher (Hatch Ltd.); Mr CHOMYN, Kyle (Hatch Ltd.); Mrs NOLET, Isabelle (Hatch Ltd.)

Presenter: JOUBARANI, Kamal (Hatch Ltd.)

Session Classification: Alternative Reduction Methods & Waste Utilization

Track Classification: Ironmaking - Direct reduction and smelting reduction