MODIPLANT Newsletter

Modular Hybrid Technology in Steel Plant production - April 2025

Welcome to the 1st edition of the MODIPLANT newsletter! In this issue, we share updates on our progress, key achievements, and upcoming events. Thank you for being part of our journey toward innovative and sustainable steel production.

EU scenario

The EU aims for carbon neutrality by 2050, with a 55% reduction in greenhouse gas emissions by 2030. Decarbonizing energy-intensive industries like steel production is crucial, as the sector accounts for 4% of total EU emissions and 23% of industrial emissions. Achieving this goal requires the establishment of a market for green steel, as highlighted in the New Industrial Strategy for Europe.

Steel production has a significant environmental impact due to its high energy intensity and reliance on fossil fuels. Reducing emissions in this sector demands a multi-pronged approach: (i) dematerialization through recycling and reuse, (ii) substantial process innovations to replace fossil fuels with electricity from Renewable Energy Sources (RES), and (iii) improved technological efficiency. Among these, optimizing and electrifying existing processes present the most viable path to minimizing the sector's reliance on traditional energy sources.

Globally, steel production continues to grow through various technological routes (Figure 1). While complete electrification of upstream steelmaking remains challenging—given the role of carbon coke in blast furnaces—downstream processes, such as hot dip coating and billet heating for rolling, offer viable opportunities for RES integration.

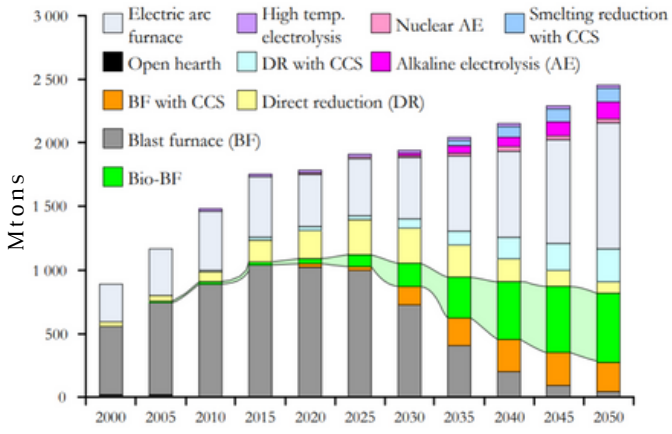

Figure 1

Bellevrat, Elie, and Ph Menanteau. "Introducing carbon constraint in the steel sector: ULCOS scenarios and economic modeling." Revue de Métallurgie 106, no. 9 (2009): 318-324.

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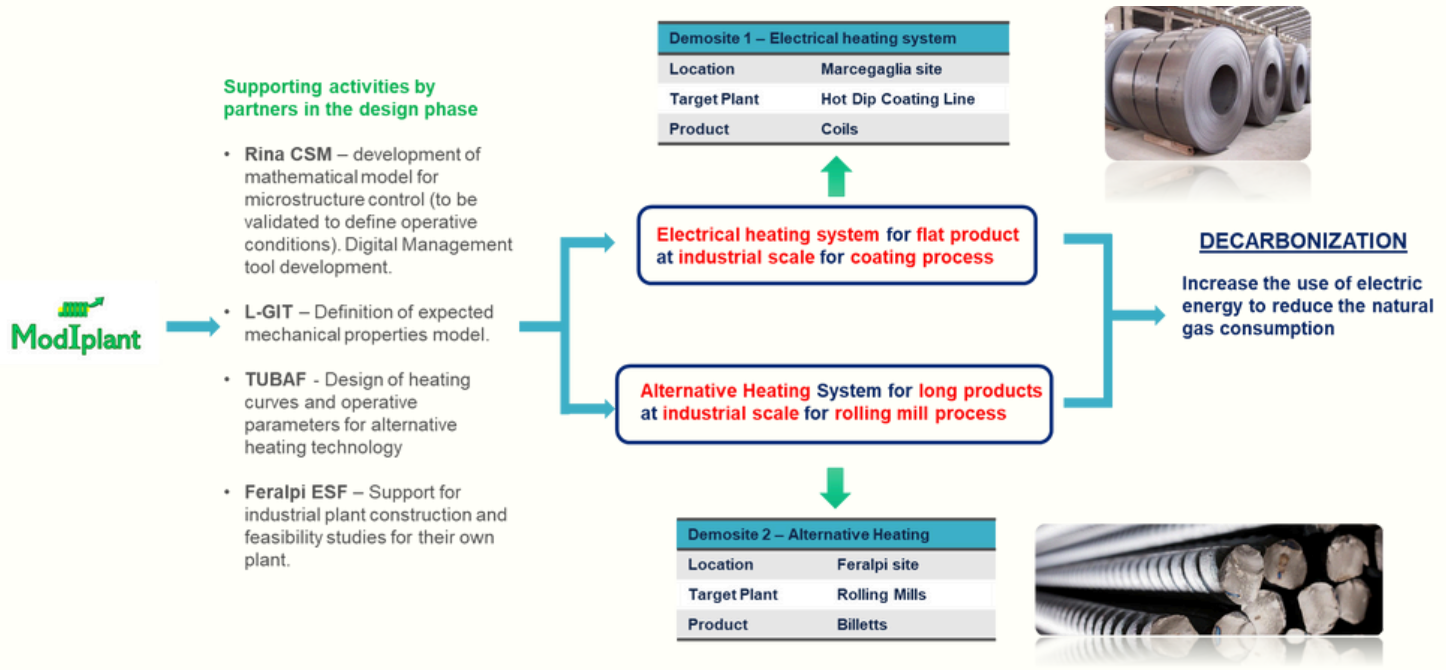
Project challenges & methodology

This project focuses on integrating RES electrification into key areas, such as bloom, slab, and billet mills, as well as hot dip metal coating lines, contributing to a more sustainable steel industry. By introducing process electrification, it will be possible to reduce the environmental impact of these specific plants while maintaining high-quality standards and economic viability.

The MODIPLANT project proposes a set of actions to demonstrate the feasibility of decarbonizing product reheating without compromising productivity. This will be achieved through synergies between industrial players and research activities. To reduce fossil fuel consumption, two RES-based heating technologies will be introduced:

- a modular RES inductor will be implemented at an industrial scale in hot dip coating lines for coils, replacing natural gas burners with RES electrical energy.
- a novel RES heating system based on Joule effect heating for billets will be developed, leading to the development of a prototype for industrial application.

Both technologies will be supported by metallurgical studies to assess their impact on product quality, ensuring the effectiveness of electrical heating solutions in the steel industry.



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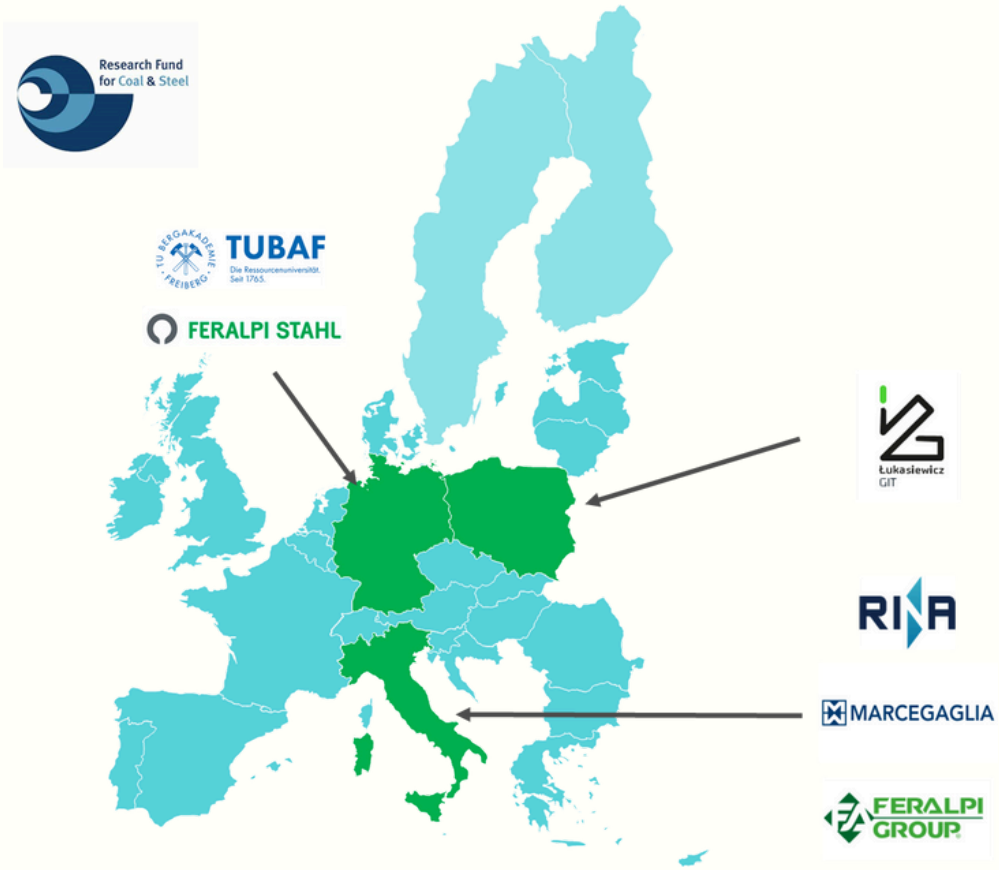
Consortium

The MODIPLANT consortium is built by 6 partners from 3 EU countries (Italy, Germany and Poland). Industrial leaders (FERALPI GROUP, and MARCEGAGLIA) work alongside three different research centers (RINA-CSM, University of Freiberg and Łukasiewicz-GIT) to integrate diverse disciplines into the development of a modular hybrid heating technology. The integration of all these different competences in the MODIPLANT consortium is crucial for work within the interdisciplinary field of hybrid heating technology, resulting in an industrially application for the next type of modular furnace in the industrial sector.



Get Involved

Are you interested in hybrid heating technologies in the steel sector? See more details at www.modiplant.eu to explore opportunities for collaboration or explore our LinkedIn pag at https://www.linkedin.com/company/modiplant-rfcs-project.

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