

MODular hybrId technology in the Steel PLANT production



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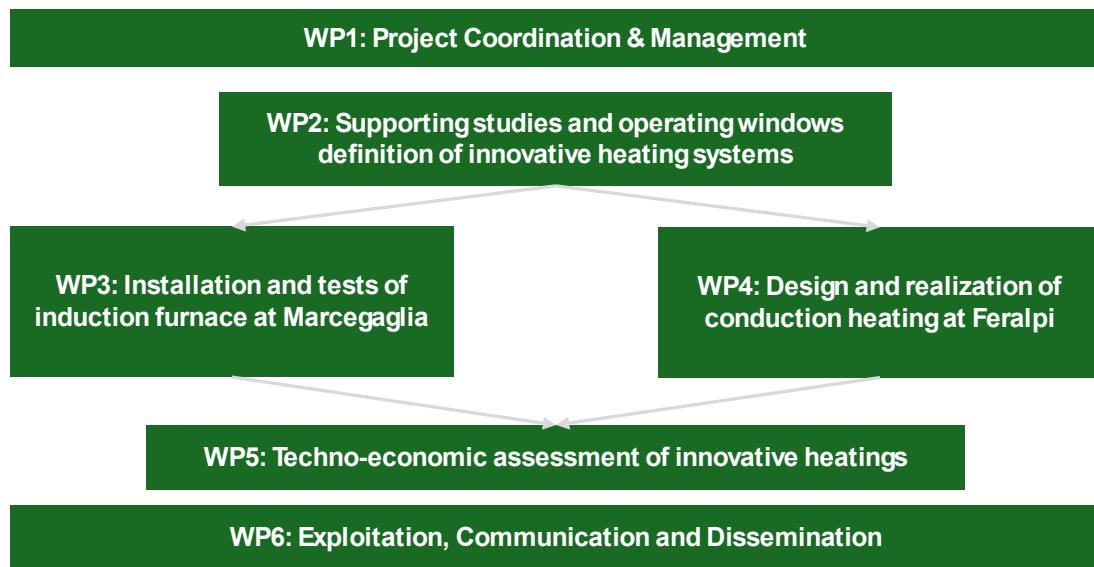


Project introduction and needs

The concept of MODIPLANT project is to introduce in the two targeted steel processes (hot dip coating of coils and hot rolling of billets) sustainable heating technologies, that are RES induction furnace for coils and RES electrical heating system for billets. Both the techniques are fed by RES electrical energy, so CO2 emissions related to process are net to zero.

Partnership of the project, coordinated by Rina-CSM, is agreed that a solid and overall business cases with different scenario analysis is fundamental to legitimate and unlock future investments. One of the key factors for the success of the technologies is the long-term revenues, mainly associated to the **equilibrium between electricity price and fossil fuel price**.

It is quite clear that such solutions are not practicable if electricity is totally produced in an unsustainable way: so, MODIPLANT approach is to define which kind of actions have to be related to reduce the costs of electricity (most promising solutions are the use of energy self-produced by renewable fuels or focusing on the heat integration for electricity generation).

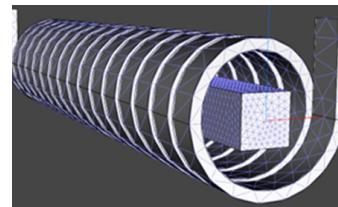


Output and goals



- **RINA-CSM** has carried out preliminary experimental trials on its pilot system. The first Rapid Annealing tests using induction heating were conducted on different steel alloys. Further tests will be performed in a controlled atmosphere, exploring different soaking times and temperatures.
- **MARCEGAGLIA** conducted a feasibility study on integrating an induction heating system into its Hot-Dip Galvanizing (HDG) line. The study identified the most suitable technological solutions based on thermal modeling, CFD simulations, and energy OPEX analysis.
- **FERALPI SIDERURGICA** assessed various configurations for a novel electrical heating system for billets, evaluating its potential implementation in their industrial plants.
- **TUBAF** has focused on evaluating induction and conduction heating systems for pre-rolling industrial ingots, assessing their electrical efficiency, and conducting comprehensive energy balance studies.
- **Łukasiewicz GIT** is investigating the impact of continuous annealing process parameters on the microstructure evolution and mechanical properties of steel strips.

The goal of MODIPLANT is to enable a sustainable and low-emission steel production route, ensuring the industry's competitiveness while addressing environmental challenges.





Partners



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