Sant'Anna
Scuola Universitaria Superiore Pisa

ISTITUTO TECIP

ESTEP

ESTEP SPRING DISSEMINATION EVENT

AULA MAGNA

SCUOLA SUPERIORE SANT'ANNA
IN PISA (ITALY)

29 - 30 MARCH 2023

RINA

MODIPLANT project

Edoardo D'Amanzo

Rina Consulting Centro Sviluppo Materiali

MODIPLANT project

Co-funded by the European Union

Name	MODular hybrId technology in the Steel PLANT production
Acronym	MODIPLANT
Project Number	101099118
Start Date	1st March 2023
End Date	1st September 2027
Duration	54 months
Call	RFCS-2022-CSP
Topic	RFCS-2022-CSP
Type of action	RFCS-PJG
Coordinator	Rina-CSM – Edoardo D'Amanzo
Partners	Marcegalia, Feralpi_ESF, Łukasiewicz Research Network (IMZ) , Feralpi_Sid, Un.of Freiburg

MODIPLANT project

Summary

Nowadays the overall energy demand in steel production is mainly based on fossil fuels, so it is fundamental to find and set new ways to overcome the environmental impact of steel production.

Currently, the state-of-art of reheating furnaces is based on CH4 burners, with an evident environmental impact on CO2 emissions.

The primary scope of this project is to decarbonize this process, based on the introduction of hybrid heating technology, based on electrification and gas-burning properly combined.
The partial electrification of the furnaces is realized by the installation of an induction system and an innovative alternative system.

The relevant aspect of this project is the full-scale applications on industrial processes.

MODIPLANT project – Objectives

- Integration of induction furnace module on hot dip metal coating process
- Realization of Alternative heating technology, for full scale billet heating in rolling mills
- Definition of optimized operating windows for long and flat product
- Development of Management IT tool: identify possible inefficiencies and bottlenecks and define corrective actions towards optimization.
- Ensuring the exploitation and visibility of the project, through the elaboration of business plan and stakeholder management

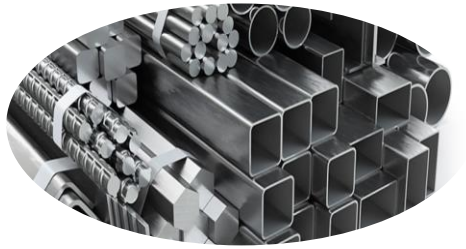
MODIPLANT project

Demosite 1 – Induction system	
Location	Marcegaglia site
Target Plant	Hot Dip Coating Line
Product	Coils

MODIPLANT

Induction furnace for flat product at industrial scale for coating process

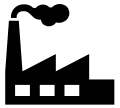
Alternative Heating System for long product at industrial scale for rolling mill process

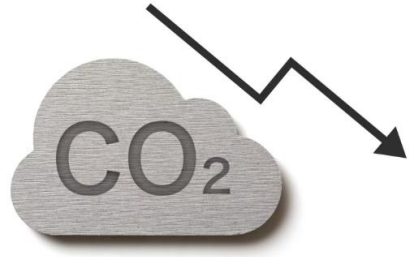


Demosite 2 – Alternative Heating	
Location	Feralpi site
Target Plant	Rolling Mills
Product	Billett

DECARBONIZATION

Increase the use of electric energy to reduce the natural gas consumption





Global organization and responsability

Design – 24 Months

- **Marcegaglia** - Design of induction furnace
- **Rina CSM** – development of mathematical model for microstructure control. Validation, definition of operative conditions. Digital Management tool
- **IMZ** – Definition of expected mechanical properties model.
- **Feralpi Sid** - Design of alternative heating for one specific product
- **TUBAF** - Design of heating curves and operative parameters for alternative heating technology

Installation – 9 Months

- **Marcegaglia** - Installation of induction furnace on Coating Line in combination with burning heating
- **Feralpi SID** - Installation of alternative heating for full scale application for one specific product

Industrial Test – 18 Months

- **Marcegaglia** – Management of industrial campaign
- **Feralpi Sid -** Management of industrial campaign
- **Rina CSM -** Digital Management tool calibration and validation

Techno-Economic Evaluations – 12 Months

- **All Partners** – Support in techno-economic evaluations.
- **Rina CSM -** Business Plan
- **All Partners -** Finalization of exploitation/dissemination strategy

Expected Results

- 60-80% CO_2 savings in hot dip metal coating process through the use of induction furnace
- 60 – 100% Fossil Fuel Consumption Reduction in rolling mills process through the use of Alternative Billett Heating
- Introduction new operative practice specifically designed for electrical heating
- Business case for fully electrification of targeted processes

Thanks For the Attention!

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Make it sure, make it simple.