HORIZON Innovation Actions

HORIZON-CL4-2022-TWIN-TRANSITION-01-16

ModHEATech

Modular Heating Technology through renewable resources for steel production

Highlights of ModhHEATech project

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement 101092234

1 ModHEATech in shorts

Nowadays the overall energy demand in downstream steel production is mainly based on fossil fuel, 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 core of **MODHEATECH** is **to decarbonize this process**, based on the introduction of hybrid heating technology, based on electrification and gas-burning properly combined. This solution provides an opportunity to explore the synergic effect of different technologies, by "hybrid heating". The furnace partial electrification will be realized by the installation of **an induction system** and **introduction of an alternative heating**. Both the solution are applied for billet heating. Finally a virtual study will assess the introduction of induction heating and Hydrogen burning not only in term of environmental impact, but also looking to implications in term of material selection and maintenance strategy

2 ModHEATech Objectives

1. Integration of induction furnace module for heating of long product
2. Integration of green electricity production with rolling mills
3. Realization at pilot scale of Joule Effect heating technology
4. Virtual study on implementation of low-C based technology in downstream process

3 ModHEATech expected results

1. Induction Heating for billets: -20% of CO2 with 2MW of inductor installed
2. Achieve a 50% of energy supplied to inductor from renewable energy self-produced
3. Increasing productivity (+10%) by applying high heating rate
4. Proving the feasibility of alternative heating technology in billets heating for special steel heating
5. Roadmap on how decarbonize rolling mills plant, until a sustainability of 100% sector. Integration of Induction Heating and Hydrogen Burners.
6. Less dependence from fossil fuels, with protection from harmful market event

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement 101092234

4 Involved Partners and Tasks

RINA	▪ Coordinator of MODHEATECH ▪ Communication&Dissemination&Exploitation strategy ▪ Induction Heating Metallurgical Analysis and Tests on pilot induction line ▪ Conduction Heating modelling ▪ Support on virtual studies in SIDENOR and FERALPI_ESF
ORI MARTIN	▪ Realization and Installation of Induction Heating Technology ▪ Industrial Tests ▪ Green Energy optimization strategy ▪ Techno-econmic evaluations ▪ Support in D&C&E strategy
FERALPI SIDERURGICA	▪ Realization of Alternative Heating Technology ▪ Pilot Tests ▪ Technoeconmic evaluations ▪ Support in D&C&E strategy
FERALPI GROUP	▪ Support in alternative heating pilot trials ▪ Feasibility study on the applicability of alternative heating in its own process ▪ Support in D&C&E strategy
sidenor	▪ Preliminary Process Assessment ▪ Innovative Solutions Virtual Simualtion ▪ Supoort in LCA/LCC and SLCA analysus ▪ Techno-econmic evaluations ▪ - Support in D&C&E strategy
Tekniker MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE	▪ LCA/LCC and SLCA analysis for introduction of Induction Furnace and Hydrogen Burner in SiDENOR rolling mills ▪ Definition of novel maintenance strategy and accelerated tests for innovative solution ▪ Support in D&C&E strategy

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement 101092234