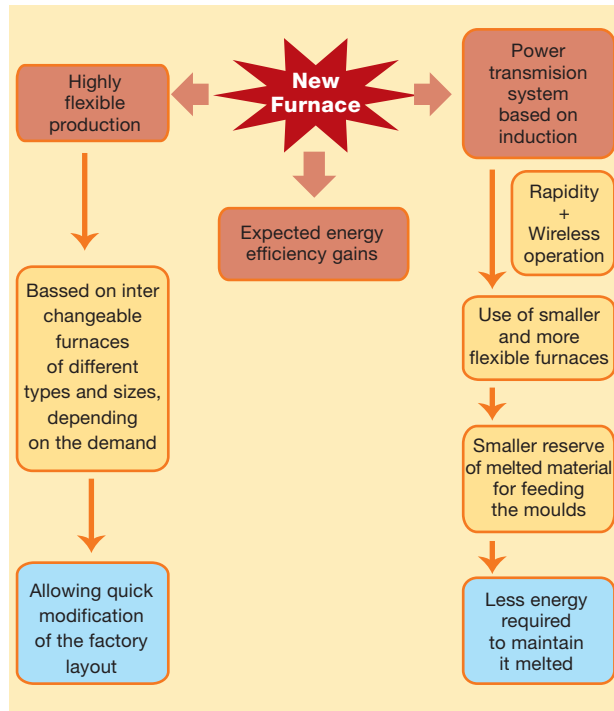


## Objectives

Demonstration of a new production process able to decrease the embodied energy of the foundry products by over 25%, reducing drastically its carbon footprint.



## Expected Results

- Recommendations for new processes and equipment.
- New integral design of processes, materials and equipment for aluminium, steel and iron demonstrators through simulation.
- New detailed concept and methodology for manufacturing processes in the metallurgical industry.
- Three furnaces prototypes to be tested including NIWE concept.
- Operation guides for the new processes and equipment.
- Definition of new production models.

## Partners

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Project Budget: 11,09 M€  
European Union funding: 6,69 M€



[www.niweproject.eu](http://www.niweproject.eu)



**NIWE**  
**New Induction Wireless**  
**manufacturing Efficient process**  
**for energy intensive industries**



This project has received funding from the European Union's Seventh Programme for research, technological development and demonstration under grant agreement n.º 296024

## Sectors tackled

Energy Intensive Industries from the sectors:



Traditional furnaces were initially designed and manufactured to be heated by coal or coke and the concept evolution has driven the newest furnaces to mostly be heated by gas or electricity resources such as: electrical arc, induction, reverberatory and crucible furnaces. However, these furnaces are still very high resources and energy demanding, as it is shown in the following table:

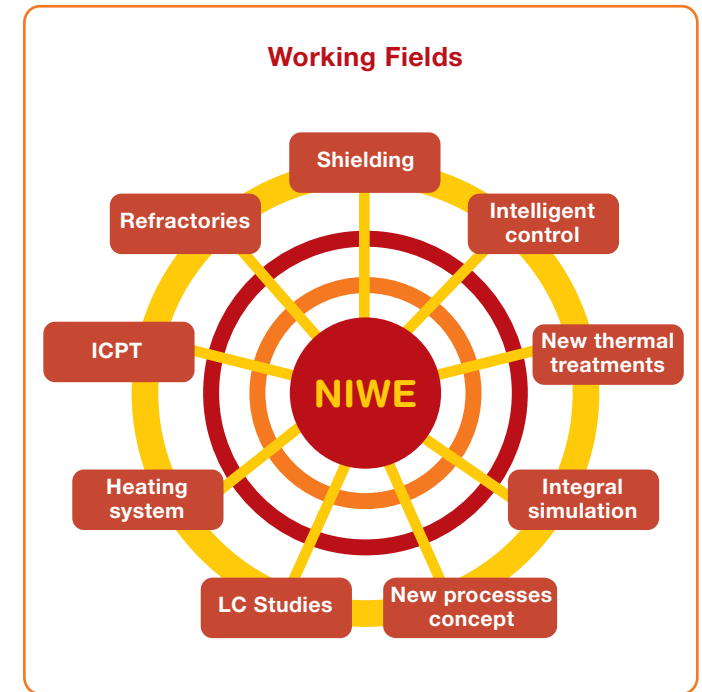
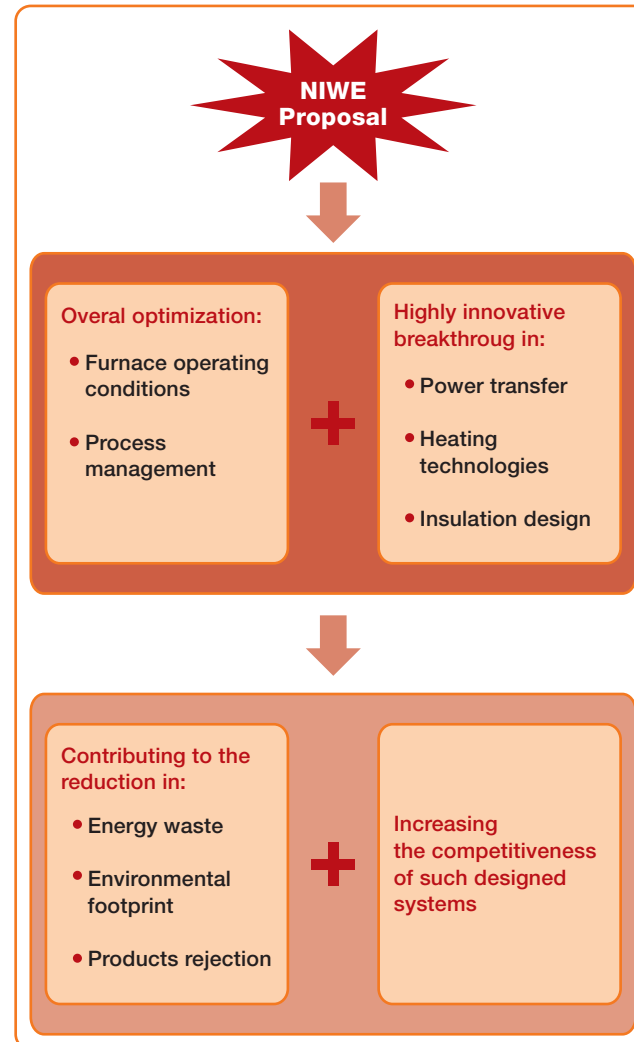
### Targeted sectors and lon-term expected impacts

NIWE targeted sectors (EU 25)	Aluminium	Steel	Iron
Production (M ton/year)	4,6	5,8 1	5,8
Turnover (billion €)	38,5	42,6	189,6
Direct employment (people)	110.000	89.000	150.000
Energy intensity (kWh/ton)	2.000	4.000	4.500
CO <sub>2</sub> intensity (tCO <sub>2</sub> /t)	0,5	0,7 - 1,3	0,7 - 1,3
Total energy (MWh/year)	9.200	41.200	56.450
Total CO <sub>2</sub> emissions (M ton/year)	2,3	6,5	24 - 45
Estimated market penetration for NIWE furnaces (5 years after project)	5%	23%	25%
<b>Estimated energy savings (MWh/year)</b>	<b>1.000</b>	<b>6.500</b>	<b>6.500</b>
<b>Estimated CO<sub>2</sub> emissions reduction (kt/year)</b>	<b>23</b>	<b>60</b>	<b>60</b>

"Imposing a unilateral carbon constraint on European energy-intensive industries and its impact on their international competitiveness" data for Aluminium, Glass, Cement and Ceramics from 2004.

## NIWE proposal

NIWE is proposing an integrated approach to achieve an overall optimisation of the furnace operating conditions and process management along with highly innovative breakthrough in power transfer, heating technologies and insulation designs, significantly contributing to a reduction in the energy waste, the environmental footprint and products rejection while increasing the competitiveness of such designed systems.



### Activities

1. Specifications of technical conditions, environmental issues and health and safety aspects.
2. Detailed design of each demonstrator: new processes, materials and equipment.
3. Validation at laboratory scale of the pilots design and simulations, prior to the construction of the demonstrators.
4. Development of the necessary technical documentation prior to the construction of the demonstrators.
5. Construction of the three demonstrators. Test and validation of the new technologies.
6. Monitoring of energy consumptions, GHG emissions, and product quality.