

Objectives

The general objective of the INEVITABLE project is to improve the performance indicators in the steel and nonferrous metals sectors by retrofitting existing production sites by digitalization and innovative control technologies, to elevate the overall digitalization level.

The main ambition is to exceed the level and functionality of traditional process automation and control systems by applying the functionalities of Digital Factories and Industry 4.0 concepts.

Expected Results

The INEVITABLE project partners will develop and upgrade various technologies:

- Electric Arc Furnace (EAF) models and optimization framework,
- System for supervision, optimisation, diagnosis and condition monitoring of Cold Rolling mills (ZRM),
- Online advisory system for process control and optimization in clean steel intelligent manufacturing,
- Predictive process models for refining and continuous casting of liquid steel,
- Smart cognitive applications to support decisions in controlling the nonferrous casting process.



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Duration: 42 Months

Type: Innovative Action

Budget: 6,1 M€

Coordinator: Jožef Stefan Institute

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**OPTIMIZATION AND
PERFORMANCE
IMPROVING IN METAL
INDUSTRY BY DIGITAL
TECHNOLOGIES**



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The Project

The project is targeting at resource and energy intensive sectors of the process industry, with focus on the **steel and nonferrous metals sector**.

Since these industries have an enormous impact on energy and resource consumption, and consequently on the environmental footprint, improvements of energy and material efficiency represent major results of the project with positive impacts on both process sustainability and environment.

The focus of INEVITABLE is to develop high-level supervisory control systems for different production plants and to demonstrate them in operational environment to enable autonomous operation of the processes based on embedded cognitive reasoning.

The project approach is based on three **enabling technological areas**:

- (i) data collection & sensor technologies,
- (ii) tools for data analysis, control and optimization,
- (iii) digitalization infrastructure;

The application of these enabling technologies will be an important step towards **digital transformation and optimization** of selected production processes.

Use Cases

Selected use cases cover several metallurgical processes, where the developed technologies will be demonstrated and validated.

SIJ Acroni

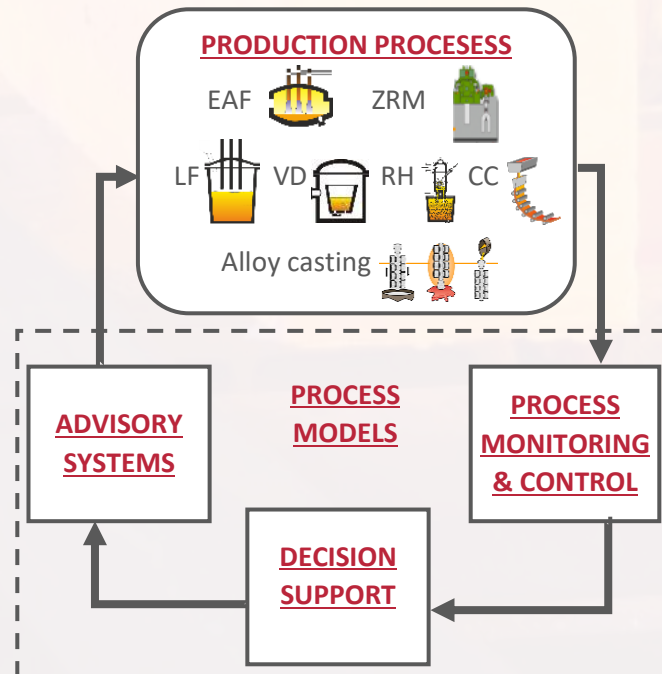
Electric Arc Furnace (EAF) steelmaking, Cold rolling steel processing (ZRM)

Sidenor, voestalpine Stahl

Secondary steelmaking via Ladle Furnace (LF) & Vacuum Degassing (VD, RH), and continuous casting (CC)

Eibar Precision Casting

Nonferrous alloy casting process



Consortium

The consortium is formed around the metal production sector and it consists of:

- *Industrial end users* (steel/metal producers SIJ Acroni, voestalpine Stahl, Sidenor Aceros Especiales and Eibar Precision Casting),
- *Institutions specialized in metallurgy and related control technologies* (BFI, KTH, K1-MET, Fundación Azterlan),
- *Process control and automation providers and research institutions* (SIEMENS, COMPUREG, University of Ljubljana - Faculty of Electrical Engineering, Jožef Stefan Institute – Department of Systems & Control).

