

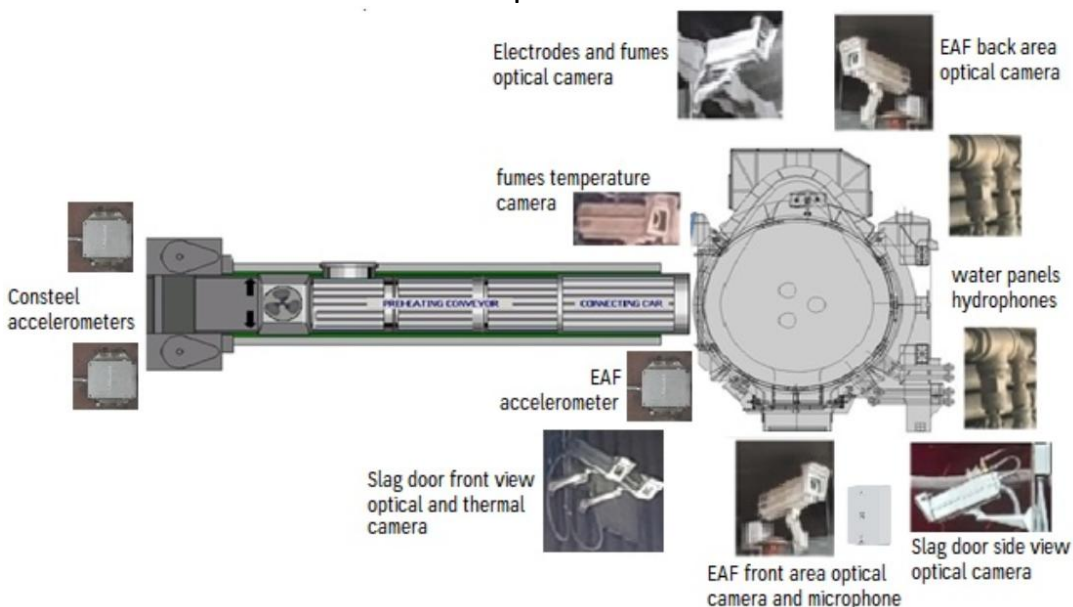
# iSteel-Expert Newsletter No 3

The concluded year was very challenging for the iSteel-Expert Consortium entering in depth in the scientific and technological challenges to be faced to develop the targeted **remote expert virtual system** for continuous monitoring of the EAF process.

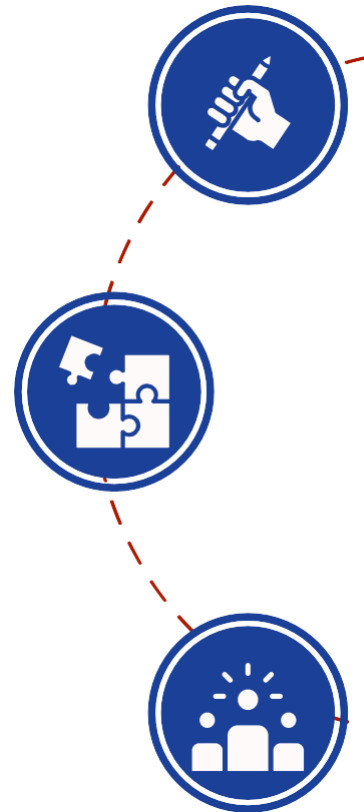
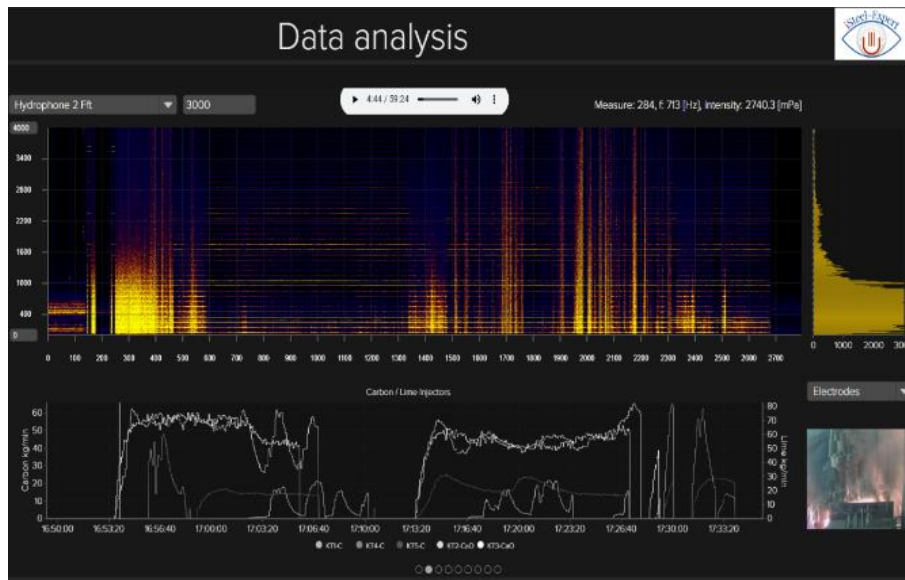
## Our challenging 2024

In the context of Work Package (WP)2, a comprehensive cloud system was successfully developed to collect and provide users with all data related to Electric Arc Furnace (EAF) operations. Key Features of the Cloud System:

- **Process Monitoring:** For each heat, the system records all process settings. It utilizes five strategically placed cameras to capture video from multiple perspectives, ensuring that all critical aspects of the process are monitored effectively. A network of hydrophones and microphones continuously records sound traces inside and around the EAF. This audio data is collected and pre-processed within the cloud to extract significant and useful information for operators.



- **Real-Time Dashboard:** The cloud system features a dashboard that displays Key Performance Indicators identified in WP1, along with their trends. This functionality enables operators to gain immediate insights into production performance.



This innovative cloud solution not only enhances operational efficiency and empowers users with timely and relevant information, facilitating better decision-making in EAF management, but also provides a substantial data source for the set-up and training of the **iSteel-Expert remote expert virtual system**

The work in WP3 gained significant momentum. This WP is core for iSteel-Expert and focuses on developing tools for process simulation, control, and event detection through advanced techniques, including artificial intelligence.

TENOVA and SSSA further enforced their cooperation in the project: one PhD student from SSSA started working on iSteel-Expert at TENOVA's facilities in Castellanza.



**Key achievements:** partners are actively developing these tools using data provided by the cloud to train and test AI models. A notable implementation is a system designed to detect human presence near the EAF. This information is crucial to enhance workers' safety and monitor personnel's presence and intervention in the facility.

Meanwhile, WP4 is leveraging the data from the cloud to create innovative training tools for operators. These tools will enable users to experience EAF production virtually, utilizing information gathered from sensors and presented through the dashboard. This approach not only enhances safety and operational efficiency but also fosters a more immersive training environment for operators, preparing them effectively for real-world scenarios.



## Dissemination

The first scientific paper derived from iSteel-Expert was presented at the **21st International Multidisciplinary Modelling & Simulation Multiconference (I3M 2024)**, which was held in Tenerife (Spain) on 18-20.09.2024. It is published in Open Access and is available at the following link:

<https://www.cal-tek.eu/proceedings/i3m/2024/emss/038/pdf.pdf>

