

AgiFlex

Newsletter #2

The AgiFlex project has concluded its First Reporting Period, namely the first 18 months of activity. The research work focused on establishing the foundations for the development of a generic agent-based computational tool by which the sustainability of steelmaking can be optimized, considering external and internal constraints.

The present Newsletter provides an overview of the work that was carried out in the different Work Packages (WP) in which the project is articulated and describes the main achievements.

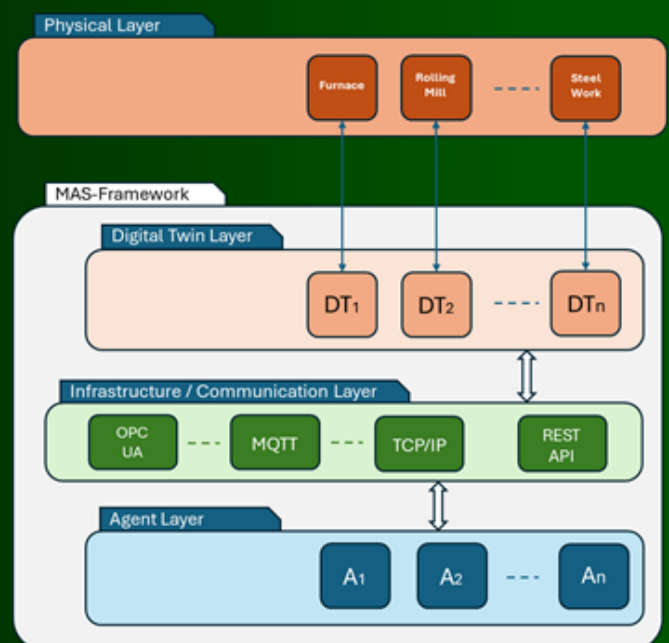
The journey is still long, but the Consortium is well progressing and is raising interest in the scientific community.

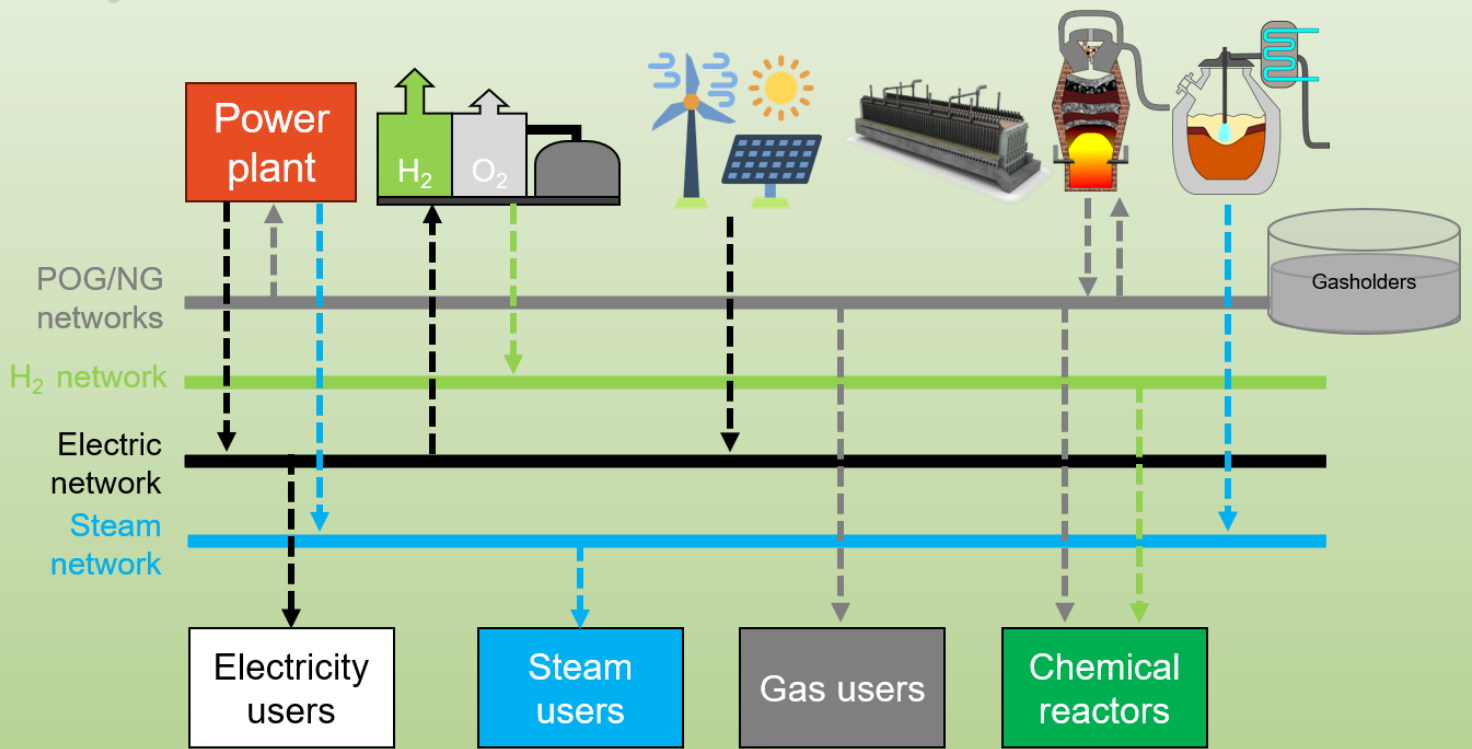
Overview of the activities

Most research efforts were spent in WP1 and WP2, which provide the foundations and the building blocks of the Multi-Agent System (MAS) to be developed, although activities in other WPs also started.

In particular, in **WP1**, which concerns the development of the overall computational framework for the MAS, the optimization problem was investigated and formalized. The available development tools were analyzed, and the most suitable ones were selected. The plant demonstration demands and constraints were identified for the two industrial partners, and the core system architecture was designed.

WP2 is dedicated to the development of the digital twins of the relevant process steps. In this context, digital twins of some process units were developed, while other components are still under development.





In **WP3**, which refers to the scenario studies to optimize process integration in the future integrated steelmaking plants, initial work was carried out concerning the analysis of framework conditions for the optimization and on the definition of future scenarios to be considered. Finally, in **WP4**, which concerns the demonstration of production and energy management at industrial sites, the selection and purchase of hardware required to run the AgiFlex solution at the sites of the industrial partners has started.

Get together

Two General Assemblies were organised as “in person” events:

- 1st GA on February 12, 2025 in Ijmuiden (The Netherlands) hosted by Tata Steel.
- 2nd GA on April 8, 2026 in Düsseldorf (Germany) Hosted by VDEh-Betriebsforschungsinstitut.

Periodic online meetings were also regularly organised for the active WPs.



Dissemination

AgiFlex is still in an early stage, and most preliminary outcomes are not mature enough for dissemination. However, the Consortium spent considerable efforts to raise awareness on the project objectives, aims and scope within the relevant scientific and technical communities. To this aim, the following presentations were provided by the researchers of Scuola Superiore Sant'Anna (SSSA):

- I. Matino, V. Colla, L. Vannini, H. Saxén, C. Haikarainen, M. Helle, M. Li, G. Zhou, K. Kemppainen, T. Hauck, M. Bernds, A.F. Nkwitichoua Djangang, B. Kleimt, A. Wolff, H. Bartusch, V. Peiss, P. van den Broeke, J. van der Stel, J. Prudente, H. Busch, M. Hecht: "Multi-agent-based approach for decreasing carbon footprint of future integrated steelworks: the AgiFlex overall concept" **7th European Steel and Applications Day ESTAD 2025**, Verona (Italy), October 6-9, 2026.
- V. Colla, S. Dettori, L. Vannini, T. Grossi, L. Pedrelli, T. Hauck, M. Bernds, E.H. Thienpont, A.F. Nkwitichoua Djangang, B. Kleimt, A. Wolff, H. Bartusch, V. Peiss, S. Rothe, C. Haikarainen, H. Saxén, I. Matino: "Digital Twins for Multi-Agent-Based Production & Energy Management Optimization of Integrated Steelworks" **AISTech - Iron and Steel Technology Conference 2026**, Pittsburgh (PA, USA), May 4-7, 2026.



Presentation at **ESTAD 2025** given by I. Matino (SSSA)



Presentation at **AISTech 2026** given by T. Grossi (SSSA)