

# SymbioSteel Newsletter No.3, 2025

## Evaluation of industrial symbiosis initiatives with defined KPIs

SymbioSteel, as an Accompanying Measure of EU RFCS, focuses on Industrial Symbiosis implementation practices involving the steel sector. Industrial Symbiosis concerns the use by one company or sector of underutilized resources from another, making those resources last for longer to enhance efficiency and sustainability. It aims to transform the steel sector by promoting collaboration and reducing environmental impact. The project aims to accelerate the adoption of Industrial Symbiosis in the steel industry, supporting decarbonization and resource efficiency.

Energy- and resource-intensive industries, such as the steel industry, play a vital role in Europe's economy, yet they are major contributors to raw material and energy consumptions, process-related emissions, and industrial residues. To address these challenges, numerous EU and nationally funded initiatives have focused on developing new process technologies, improving material recovery strategies, and integrating alternative resources.

### Industrial Symbiosis KPIs

SymbioSteel evaluates the outcomes of these Industrial Symbiosis initiatives by defining and tracking a set of KPIs, which measure progress in areas such as emission reduction, resource substitution, waste minimization, and by-product utilization. The research draws on data from 50 European and nationally funded projects, with 19 of them showing a good example of IS implementation with the necessary data for KPI evaluation. These projects encompass a wide range of processes, including coke making, iron ore sintering, blast furnace (BF) and basic oxygen furnace (BOF) operations, electric arc and ladle furnaces (EAF and LF), slag valorization, the use of plastics and biomass-derived carbon materials such as charcoal and biochar, as well as CO<sub>2</sub> utilization solutions.

### Consortium team:





## List of the defined KPIs

An overview of the Industrial Symbiosis KPIs defined in the project is presented in the table below.

KPI No.	KPI name
KPI I	Energy efficiency.
KPI II	Direct CO <sub>2</sub> emissions (Scope 1) reduction.
KPI III	Reduction in virgin raw material usage.
KPI IV	Enhancing the recycling of low-quality steel scrap.
KPI V	Slag recycling rate.
KPI VI	Dust and sludge recovery and reuse.
KPI VII	Recycling rate of iron-rich residue streams.
KPI VIII	Replacement rate of fossil carbon materials.
KPI IX	CO <sub>2</sub> capture rate from process/off-gases.
KPI X	Share of carbon content in process gas (CO <sub>2</sub> /CO) transformed into products.
KPI XI	Technology readiness level.

## Current findings

- Among the KPIs, the replacement of fossil-based carbon materials (KPI VIII) appeared as the most widely addressed target.
- Several projects showed that it is possible to substitute coal and coke with alternative carbon sources. These sources include biochar, polymers from plastic waste, refuse-derived fuel (RDF), and industrial residues, all while keeping process efficiency.
- Significant progress was also observed in the valorization of solid residues, such as slags, dusts, and sludge (KPIs III, V, VI, and VII). Several projects reported full or near-complete recycling of these materials, integrating them into construction and agricultural applications, etc.
- While some KPIs, notably KPI I (energy efficiency) and KPI IV (enhancing the recycling of low-quality steel scrap), were underrepresented, this identifies clear areas for further research and data collection for KPIs monitoring.

[See more in our deliverable 3.2](#) ►





## Next steps

Based on these findings, the following steps for SymbioSteel will focus on deepening the quantitative assessment of IS practices. This will involve broadening KPI evaluations across additional EU and national projects, with a focus on searching for data related to energy efficiency and the recycling of low-quality scrap. These efforts aim to facilitate the broader adoption of IS solutions.

## A survey on Industrial Symbiosis in Steel

In June, the SymbioSteel project launched a « *Survey on activities and trends on Industrial Symbiosis in the steel sector* », to investigate both adoption and to map future opportunities.

The survey is aimed at the whole process industry, as many sectors can be part of symbiotic relationships.

Any actor with insight into European process industry is welcome to fill out the survey!



QR code to survey

Fill out the survey ►

## Stay tuned for updates

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