

PRESS RELEASE

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EU project “DiGreeS” aims to make steel production “greener”, more digital, and more economical.

Digital production platform aims to make steel production more sustainable and energy-efficient

The transition to environmentally friendly and low-carbon steel production in Europe requires a considerable reorganization and restructuring of steel production processes. This applies in particular to the implementation of new and innovative steel production methods. To plan and manage these enormous challenges and ensure sustainable steel production, a user-friendly digital platform for networked steel production is to be developed as part of the EU project “DiGreeS”* – under the leadership of the Fraunhofer IZFP in Saarbrücken – with a total of 11 European partners from industry and research. The European Union is funding the project with around 5 million euros.

It is everywhere and we have all come into contact with it: The all-rounder material “steel”. It can be found in cars, ships, bridges, high-rise buildings, tools and household appliances, for example, and it is impossible to imagine life without it. However, the production of this “all-round talent” is currently having a significant impact on our climate, particularly due to the high CO₂ emissions and the enormous energy consumption required for the entire steel production process.

Sustainable and digital steel production

The EU project DiGreeS, which starts in November 2024, aims to develop a user-friendly digital platform for networked steel production. The aim of the 3.5-year project is to implement an integrated digitalization approach for the steel value chain: For example, it aims to enable improved use of the industrial data collected along the process chain based on innovative and “soft” sensors.

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* Demonstration of digital twins for a green steel value chain

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The innovative digitalization solutions used are intended to improve the product quality of the steel products and the raw material and energy efficiency of the manufacturing process, thereby increasing their recyclability. © Adobe Stock / MP Studio

Optimized product quality, lower CO₂ emissions, lower energy consumption, lower costs

As part of the research project, comprehensive digital twins will be developed to improve the efficient verification of steel scrap, the real-time control of crude steel production at the electric arc furnace and the quality of intermediate and end products, and to increase process yield. In this context, the potential of artificial intelligence and machine learning technologies will also be fully exploited to support the optimal use of process data. Various scenarios will be modeled for three different use cases: The innovative digitalization solutions used are intended to increase the product quality of the steel products, the raw material and energy efficiency of the manufacturing process and thus increase their recyclability. At the same time, the digital platform aims to reduce the steel industry's CO₂ emissions by up to 6 million tons per year and save annual costs of up to €800 million.

DiGreeS consortium

The consortium has eleven partners from industry and research:

- Fraunhofer-Gesellschaft e. V.: Fraunhofer IZFP (leading coordination) (DE)

The **Fraunhofer-Gesellschaft**, based in Germany, is a leading applied research organization. It plays a crucial role in the innovation process by prioritizing research in key future technologies and transferring its research findings to industry in order to strengthen Germany as a hub of industrial activity as well as for the benefit of society. Founded in 1949, the Fraunhofer-Gesellschaft currently operates 76 institutes and research units throughout Germany. Its nearly 32,000 employees, predominantly scientists and engineers, work with an annual business volume of 3.4 billion euros; 3.0 billion euros of this stems from contract research, which is divided into three funding pillars. Fraunhofer generates a share of this from industry and license-fee revenue, totaling 836 million euros. This high proportion of industrial revenue is Fraunhofer's unique selling point in the German research landscape. Another share of contract research revenue comes from publicly funded research projects. The final share is base funding supplied by the German federal and state governments and enables our institutes to develop solutions now that will become relevant to the private sector and society in a few years.

SENSOR AND DATA SYSTEMS FOR SAFETY, SUSTAINABILITY, AND EFFICIENCY

- K1-MET GmbH (AT)
- HUN-REN SZTAKI - Szamitastechnikai es automatisation kutatointezet (HU)
- VDEh-Betriebsforschungsinstitut GmbH (DE)
- Fraunhofer Austria Research GmbH (AT)
- SPECTRAL Industries BV (NL)
- Tata Steel Nederland Technology BV (NL)
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- voestalpine Steel & Service Center GmbH (AT)
- voestalpine group-IT GmbH (AT)
- ESTEP plateforme technologique européenne de l'acier (B)

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DiGreeS Key Data:

- **Leading coordination by Fraunhofer IZFP (Dr.-Ing. Madalina Rabung)**
- **Funded by: European Union (HORIZON-CL4-2024-TWIN-TRANSITION-01-44)**
- **Duration: 11/2024 to 04/2028**
- **Total EU funding amount: around € 5 million**
- **Demonstration of Digital twins for a Green Steel value chain | DiGreeS | Project | Fact sheet | HORIZON | CORDIS | European Commission**
- **Link to the DiGreeS-Website**

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