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PRESS RELEASE

de:karb research project to show carbon footprint across the entire supply chain

Research project by Trumpf, Thyssenkrupp Materials Services and Fraunhofer IPA to mitigate the climate impact of sheet metal processing. The de:karb project will create an open platform enabling companies to determine a specific component's carbon footprint. Germany's Federal Ministry for Economic Affairs and Climate Action (BMWK) is providing funding of 8.3 million euros.

A project consortium headed by Trumpf and including Thyssenkrupp Materials Services and the Fraunhofer Institute for Manufacturing Engineering and Automation IPA is investigating ways of reducing carbon emissions in sheet metal processing. The goal is to create a freely accessible online platform that companies can use to accurately determine the carbon footprint of any component.

"Digitalization is the key to mitigating the climate impact of industry", says Jens Ottnad, Trumpf project lead. "As a leading supplier and user of digitally networked production systems, we have everything it takes, together with our project partners, to make the world of sheet metal processing more sustainable." The project was launched in June and will run for three years. Germany's Federal Ministry for Economic Affairs and Climate Action (BMWK) is providing funding of 8.3 million euros.

Online platform to show where emissions arise

An online platform will enable companies to identify which measures, implemented at which stage of production, will result in the greatest reduction of carbon emissions. For this purpose, Trumpf and Thyssenkrupp Materials Services will connect their own IT systems to the platform. "To reduce emissions, companies must first know the size of their own carbon footprint", explains Sebastian Smerat, project lead at Thyssenkrupp Materials Services. "The new online platform will give them the transparency they need for that. In turn, this will simplify compliance with regulations and lay the foundations for a circular economy."

Using machine and production data, the project partners will be able to determine the impact of measures intended to increase sustainability. This includes the concrete reduction in carbon emissions that companies can achieve when they produce a greater number of components from a specific amount of metal or avoid unnecessary shipments of materials. "One specific feature of de:karb is that it aims to cut carbon emissions by making optimizations along the entire value chain", says Marco Huber, project lead at Fraunhofer IPA. "For this, artificial intelligence (AI) and machine learning will play a central role."

Supported by:

Federal Ministry for Economic Affairs and Climate Action

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AI support and greater connectivity

According to the BMWK status report on climate action, the production of steel and sheet metal is responsible for around one-quarter of all industrial emissions in Germany. In particular, production of the raw material consumes a large amount of energy. A project priority will therefore be to improve the utilization of materials in production. To this end, Trumpf is working on new nesting technologies that use AI to increase the number of parts that can be cut from each sheet of metal.

At the same time, the project will focus on the optimization of production scheduling. Here, Fraunhofer IPA is looking at how AI can be used to factor in ecological considerations during the production process. This might involve scheduling energy-intensive steps such as laser processing for times when maximum electricity from renewable resources is available. In addition, such production strategies are intended to give companies the freedom to process orders flexibly.

The task of Thyssenkrupp Materials Services is to coordinate material flows, value streams and data streams by means of a digital platform that is still to be developed. This will provide full traceability of input materials and their characteristics. The use of uniform standards will ensure the requisite connectivity.

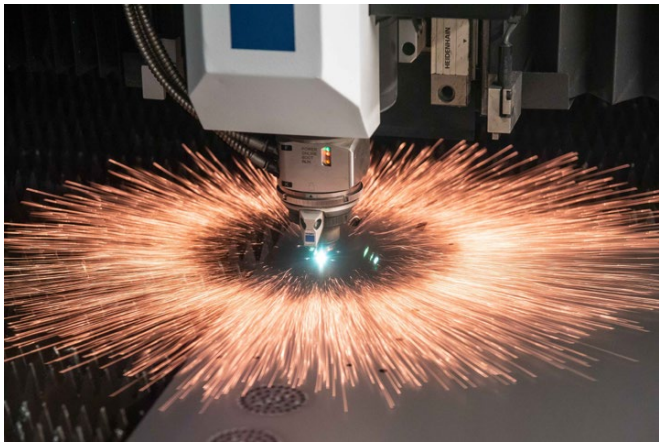
Carbon footprint as a competitive factor

Manufacturing's ecological footprint is becoming an increasingly important competitive factor. As such, this project also responds to the changing needs of customers and companies. "In western markets, especially, customers are paying more and more attention to the carbon emissions produced by companies", Ottnad explains. "Those that can show they have particularly climate-friendly value chains will secure themselves a competitive advantage." The project also includes the following partners: management consultancies AEC and SES-Ingenieure, Baden-Wuerttemberg Cooperative State University (DHBW), AI start-up Nash and sheet metal processor H.P. Kaysser.

Project fact sheet

Full title:	de:karb – Decarbonize manufacturing industry
Funding partner:	Federal Ministry for Economic Affairs and Climate Action
Duration:	1 June 2023 – 31 May 2026
Project partners:	Trumpf (Project Leader), Thyssenkrupp Materials Services, AEC, SES-Ingenieure, Baden-Wuerttemberg Cooperative State University (DHBW), Nash and H.P. Kaysser

Employees in materials distribution
With partners and under the leadership of Trumpf, Fraunhofer IPA is investigating in the de:karb project how to mitigate the climate impact of sheet metal production.
Source: Thyssenkrupp Materials Services



A laser machine cuts a component
Energy-intensive processes such as laser cutting should be scheduled for times when sufficient electricity from renewable resources is available.
Source: Trumpf

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With nearly 1200 employees, the **Fraunhofer Institute for Manufacturing Engineering and Automation**, Fraunhofer IPA, is one of the largest institutes in the Fraunhofer-Gesellschaft. The total budget amounts to € 90 million. The institute's research focus is on organizational and technological aspects of production. We develop, test and implement not only components, devices and methods, but also entire machines and manufacturing plants. Our 19 departments are coordinated via six business units, which together conduct interdisciplinary work with the following industries: automotive, machinery and equipment industry, electronics and microsystems, energy, medical engineering and biotechnology as well as process industry. The research activities of Fraunhofer IPA aim at the economic production of sustainable and personalized products.