19th International Conference on Environmental Science and Technology

Kos, Greece, 3 to 6 September 2025

Circular Saar - Circular design thinking in the German steel industry

Wern, B.[1]*, Vielhaber, M.[1]

[1] IZES gGmbH, Altenkesseler Strasse 17, 66115 Saarbruecken, Germany

* corresponding author: Bernhard Wern, e-mail: wern@izes.de

Abstract The steel industry is currently facing many challenges, such as increasingly expensive energy and the availability of raw materials. At the same time, the transformation of many industrial processes takes time. The circular Saar project addresses these challenges by bringing together research institutions from various disciplines such as data science, engineering, political science, law and product research to investigate how circular economy processes and design thinking processes can have a positive impact on the challenges facing the steel industry.
Keywords: Transition, steel industry, circular thinking

1. Introduction

Structural change poses major challenges for Saarland. The target of climate neutrality by 2045 and the creation of a post-fossil infrastructure require a transformation of the automotive and steel industries towards greater technological sovereignty, self-sufficiency and resilience.

Project aim

The establishment of a circular economy in steel industry is - in addition to a secure energy strategy - an essential basis for a future-proof industry, especially in the material and energy-intensive industries in Saarland region, Germany. One aim of the project is to develop not only circular economy technologies but also associated, suitably viable business models that can open up opportunities for new market participants in addition to existing companies and process owners.

Including the companies

Existing companies will be supported (accelerated) on their path to the circular economy, and derived business model ideas can lead to corresponding spin-offs. If a spin-off were to emerge from every second topic area, the project would result in around 4-5 spin-offs, which would create further job potential. For example, a spin-off is already being considered from the cross-sectional area of sustainability assessment and forecasting.

2. Course of action

The project aims to establish a new scientific field at the university in collaboration with its non-university research institutions. Considerable third-party funding, including non-state funding, is already being acquired in specific areas, particularly in collaborative projects. However, the project is intended to create the basis for becoming eligible to apply for more comprehensive and higher-value third-party funding projects for which there is currently no sufficient basis in Saarland, e.g.

- Research Training Groups

- special research areas

- Research buildings.

The aim of the project in terms of its scientific connectivity is to submit at least one application in each of the above categories by the end of its term.

The project is structured in 8 project packages, package 1 to 4 are focussing the development of materials and tools, the package 6 and 7 enhance the product and process data and their opportunities in the companies, meanwhile the package 8 is a cross-cutting topic and focuses on transformation resilience of the results.

Figure **1.** shows this project structure.

The Poster will give a overview about the project and the action results.

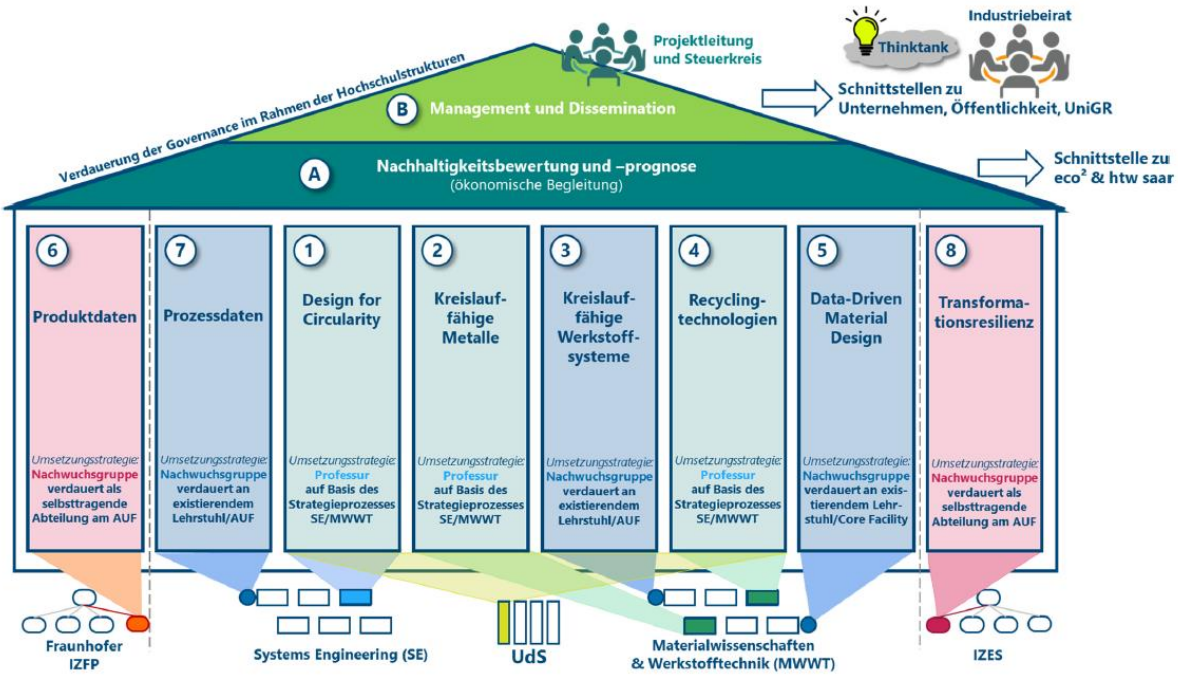

Figure 1. structure of the project