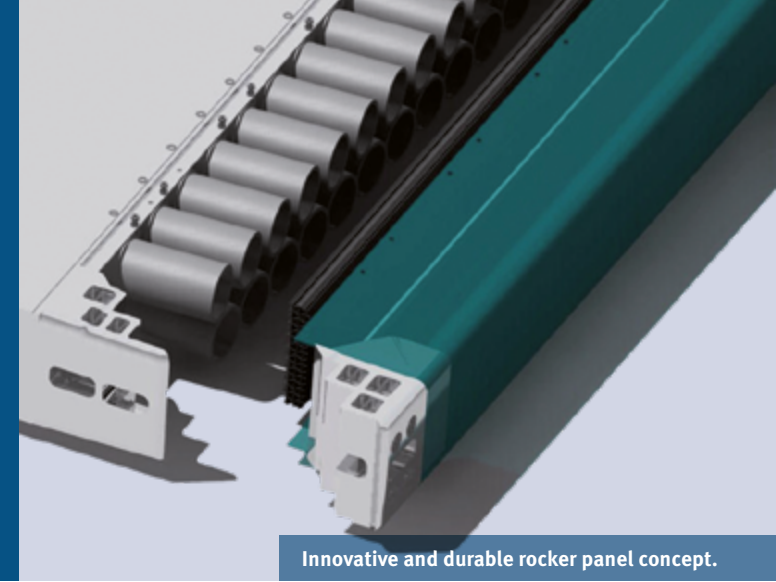


KOSEL

Reusable open source design kit for electrically powered pool vehicles

Automotive manufacturing is energy- and resource-intensive along the international value chain. A longer service life of vehicles is therefore of great ecological and economic benefit. The innovative solution of the cycle-oriented open-source construction kit for electrically powered pool vehicles of the “KOSEL” project contributes significantly to resource conservation and circular economy through remanufacturing and reuse.



Innovative and durable rocker panel concept.

Durable modules

On average, passenger cars are exported or scrapped after less than 15 years of use. By doubling the mileage, automotive customers could significantly reduce emissions from vehicle production and also the depletion of raw materials. For this reason, “KOSEL” aims to develop particularly durable modules, for example by using low-corrosion and low-fatigue materials such as fiber-plastic composites. Against this background, the project has ambitious technical, economic and ecological goals.

Reusable vehicle platform

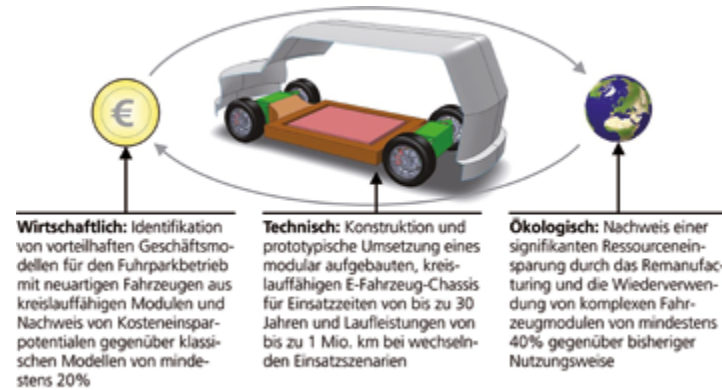
In the technical area, the design and prototypical implementation of a modular, recyclable e-vehicle platform for periods of use of up to 30 years with mileages of up to one million kilometres will be carried out. In the economic area, the identification of advantageous business models for fleet operation with new types of vehicles from recyclable modules and proof of cost savings potential compared to classic models. In the ecological field, significant resource savings are to be demonstrated through remanufacturing and the reuse of complex vehicle modules.

First results

Work on the modular system is progressing continuously. Particular attention is being paid to durable structures and open-source interfaces. New types of crash absorbers are being used that can absorb a lot of kinetic energy while being lightweight. These, as well as the structure-determining rocker panel, are manufactured using a cost-effective pultrusion process.

Different approaches are being taken to the chassis and drivetrain. A central electric motor is used on the front axle to drive the wheels, which are mounted on a leaf spring. The rear axle uses a swing-arm axle with adjustable leaf spring, for which a patent application has recently been filed.

Consideration of business models shows that economic viability is a given due to the long service life. From an ecological point of view, resource consumption is reduced.



The project aims of “KOSEL”: A circular construction kit.

Resource-efficient Circular Economy – Innovative Product Cycles (ReziProK)

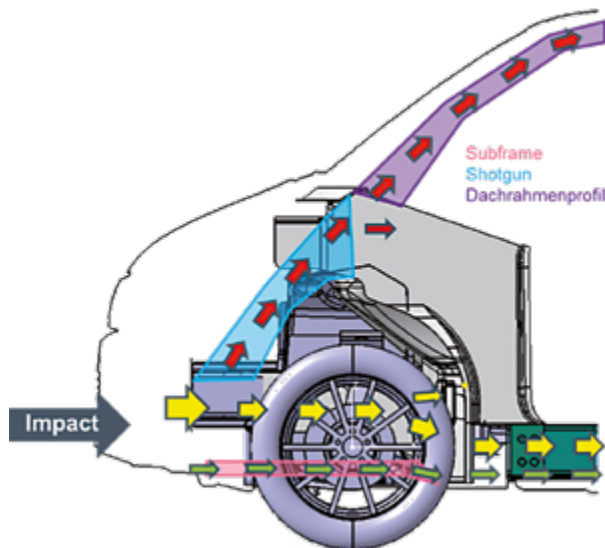
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Results and their use

The cycle-compatible “KOSEL” mobility concept is intended to serve as a model and trigger further developments in the mobility sector. Especially with an elaborated, cycle-capable e-vehicle platform as a standard solution, development costs and risks can be reduced. The open-source interfaces will also make it attractive for a number of suppliers to provide suitable standard components.

In the long term, the lead company EDAG intends to support young companies in the rapid and cost-effective development of vehicle products based on the modular system. For the fleet operator BSMRG GmbH, the planned longer operating times and reuse options will lead to cost reductions in vehicle operation and thus contribute to competitiveness. For INVENT GmbH, sensor integration and condition monitoring are of particular relevance for a long service life of the components. At Röchling Engineering Plastics, the aim is to supply customers with more durable and robust products and thus to open up new markets.



Crash load paths in the front vehicle.

The Environmental Economics Department of the Technical University of Dresden is developing a method for ecological and economic optimization using life cycle assessment for the new vehicle concept. For the Fraunhofer IWU and the Emden-Leer University of Applied Sciences, the results to be obtained in this project are an important intermediate step on the way from basic research to concrete implementation in practice, i.e. technology transfer.

The results expected from this project form the basis for a foreseeable future utilization by various contractual partners in the automotive industry. In addition, licenses will be granted to interested third parties as far as possible.

The project “KOSEL” is funded within the funding measure “Resource-efficient Circular Economy – Innovative Product Cycles (ReziProK)”.

“ReziProK” is part of the research concept “Resource-efficient Circular Economy” of the Federal Ministry of Education and Research (BMBF) as part of the FONA Field of action 6: “The circular economy – efficient use of raw materials, avoiding waste” and supports projects that develop business models, design concepts or digital technologies for closed product cycles.

Funding measure

Resource-efficient Circular Economy – Innovative Product Cycles (ReziProK)

As part of the FONA Field of action 6:

The circular economy – efficient use of raw materials, avoiding waste.

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KOSEL – Reusable open source design kit for electrically powered pool vehicles

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