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Kick-Off of project "Gabriela" – Resource-Efficient, Recyclable, Lightweight Battery Housing

On 30 August 2022, the Gabriela Project kicked off to a successful start at the first major consortium meeting of the project partners, held at project coordinator APK AG's Merseburg Germany headquarters. The project's name is derived from its German title: "**Ga**nzheitliche **B**earbeitung von Kunststoff**r**ecyclingpfaden für ressourceneffizi**ie**nte und kreislauffähige **L**eichtbau-B**a**tteriegehäuse" (*Holistic Processing of Plastic Recycling Paths for Resource-Efficient and Recyclable Lightweight Battery Housing*). Important topics discussed at the meeting included material and process routes, initial findings from preliminary testing, and definition of the next steps to be taken.

The impetus behind the project is the EU's Green Deal, which is aimed at achieving climate neutrality by 2050. A critical contribution to the implementation of the EU's strategy is the recycling of plastics, including a push for the use of high levels of plastic recyclates in new products. Functionally integrated lightweight construction with a significant proportion of polymer-based materials is already playing a key role in CO2 reductions in the mobility sector. Incorporating recyclates in lightweight structures can significantly expand these potential reductions even more by reducing the use of primary raw materials and the associated emissions.

There have, however, been major reservations about the recycling potential of composites, such as the fibre-reinforced thermoplastics used in structurally relevant lightweight components. In particular, existing mechanical recycling processes are not able to successfully separate the composites from each other. It is still uncertain whether the shredded material can be directly used as a recyclate or whether the material composite must be completely dissolved. For this reason, complementary strategies for the use of recyclates and the recycling of thermoplastic-based lightweight components in the mobility sector need to be defined and put forward.

The Gabriela consortium project will study the recyclability of automotive supplier Kautex Textron's Pentatonic high-voltage battery housings. Plastic recyclate proportions of up to 100% will be evaluated. APK AG's new adaptive recycling technology Newcycling®, which enables the production of high-quality recyclates, will be one of the technologies used in the project. As part of the project, the entire life cycle of a fibre-reinforced plastic battery housing will be examined, from material production to initial fabrication, through ageing during use, to recycling, and finally to reuse in the same component. To optimally exploit the potential of the new recycling paths, industry partners representing all stages of the production process and three German universities are participating in the project. For Kautex Textron, the main focus is on the development and validation of their Pentatonic battery system manufactured using recycled materials in the series production process. Collaboration with the research network "Platform FOREL" will enable the participating researchers to network across industries, facilitating the development of recycling options that are both scientifically and economically optimal.

The Gabriela research and development project is funded by the German Federal Ministry of Economics and Climate Protection (BMWK) as part of the Lightweight Construction Technology Transfer Programme (TTP LB) and supervised by the Jülich Project Management Organisation (PTJ). Responsibility for the content of this release lies with the author.

Project start: 1 July 2022
Duration: 3 years
Project partners:
Alliance partner: APK AG (consortium leader)
Kautex Textron GmbH & Co. KG
Vecoplan AGiPoint-systems GmbH
TU BA Freiberg / Institute of Mineral Processing Machines and Recycling Systems Technology
TU Dresden / Institute of Lightweight Engineering and Polymer Technology (ILK)
TU Braunschweig / Institute of Machine Tools and Production Technology (IWF)

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customers, including thermoplastic composite and composite-metal hybrid battery systems. From a lightweight battery system to a hybrid fuel system to autonomous drive vehicle cleaning systems, Kautex is committed to pioneering solutions for the era of new mobility.

Our employees are part of a global community committed to solving customer needs, leveraging diverse skillsets, making sustainability a differentiator, embracing the diversity that is part of a global, multi-industry leader and creating an environment where employees can build a dynamic career. Together, we are reimagining the future of mobility.

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