



SUSTAINABLE SYSTEMS

Fields of Expertise TU Graz

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Urs Leonhard Hirschberg,
Sustainable Systems

Source: Lunghammer – TU Graz

In the 20th round of the initial funding program, a total of eight proposals were submitted in the Sustainable Systems category. Because they were of high quality and because we didn't exhaust the funding in the previous round, we decided to fund five of them.

Isabel Galan Garcia from the Institute of Applied Geosciences was successful with the proposal "Corrosion initiation under the influence of chloride for concrete compositions common in Austria". For a sustainable development in infrastructure constructions such as bridges, knowing as much as possible about corrosion patterns in concrete is crucial. Currently in Austria there is no standardized measurement method or test procedure for determining the most relevant parameters. A consortium led by Dr. Galan, consisting of leading scientists in the fields of cement chemistry, concrete technology, electrochemical corrosion and sensor technology wants to come up with such a method and gain detailed knowledge about the influence of chloride on corrosion initiation.

"Expansion of a life cycle assessment methodology in the construction sector - classification systems and environmental impacts of land use and land transformation" is the title of the proposal submitted by **Aleksandra Pavicevic** of the Institute

of Architecture and Landscape. Degenerative land use change (LUC) caused by humans is currently the greatest threat to the natural habitats of many plant and animal species and subsequently to biodiversity. With a consortium of scientists from TU Graz, BOKU Vienna and ETH Zürich, the proposed FFG project plans to develop the basis for an assessment system which allows to classify LUC already in an early planning (design) and development phase.

The "Integration of heat pumps into energy systems of existing districts" is the topic of the successful proposal by **Andreas Heinz** from the Institute of Thermal Engineering. In the transformation of our energy systems, inner-city neighborhoods play a special role, because of the variety of existing structures, building types and ages that such neighborhoods typically consist of. With a structured analysis and by studying the real-life case of the TU Graz Inffeld campus, the project proposes to develop practice-oriented solutions for the integration of heat pumps into existing energy networks.

Reinhard Klambauer from the Institute of Electrical Measurement and Sensor Systems proposed ALPSAFE, an early detection system for dangers from sediments in alpine rivers and streams. In Alpine regions, flood events in torrents are

almost always associated with the fluvial transport of sediments and also associated with debris flows. In collaboration with the institute of hydraulic systems, Klambauer's proposed FFG project aims to develop unified standards for the degree of filling of bedload retention basins and spaces and thereby provide the basis for a more consistent danger detection.

The project with the charming short title BIOCHARm was proposed by **Dominik Maierhofer** from the Institute of Structural Design. Biochar is a porous solid carbon material produced in a process involving thermo-chemical conversion of biomass in the absence of oxygen at relatively low temperatures and it is one of the most promising solutions for carbon dioxide removal (CDR). Biochar can be applied in various industries to permanently lock carbon away from the atmosphere and simultaneously contribute to sustainable value creation. In the building industry it can be used as a composite material with interesting thermal properties. Maierhofer's FFG project aims to develop and test novel BIOCHAR materials that could enable construction with negative GHG emissions.

We wish all applicants the best of luck with their proposals and hope that the resulting projects can one day be presented on these pages. ●