

Constructing buildings with re-useable components

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The Institute for Civil Engineering and Environment (INCEEN) at the University of Luxembourg have signed a "memorandum of understanding" with the Suisse Federal Laboratories of Materials Science and Technology (Empa) of the domain of ETH Zürich to collaborate on research on energy efficiency in the construction sector.

As the [building](#) sector is generating a large amount of CO2 emissions, resource consumption and waste production, new eco-construction approaches are needed. Therefore, the first collaboration project entitled "Eco-Construction for Sustainable Development" (ECON4SD) will focus on the development of novel components and design models for resource and [energy efficient buildings](#) based on the construction [materials](#) concrete, steel and timber.

ECON4SD will bring together researchers from different [civil engineering](#) fields and architecture at the University of Luxembourg and the Empa Zürich, as well as from universities abroad in cooperation with partners from industry and consultancies in Luxembourg. One vision of the project is to develop building components that can be re-used after a building has reached the end of its [life cycle](#) and is disassembled. "The ECON4SD aims to turn buildings into materials and components banks and will allow producers of [structural elements](#) to come to a different business model. That would consist in loaning materials or components to customers and take them back after use in a particular building, in order to resell them directly, recondition or recycle them," commented professor Danièle Waldmann of the University of Luxembourg.

"Thereby, the project paves the way for a future CE material or component passport comparable to the already existing energy passport."

The focus of the research will lie on modularity, flexibility, adaptability and upgradability with detachable inter-structural connections. These components should require as little maintenance and repair work as possible, and be easily disassembled, and re-used. Thus, the whole service life of the structural elements will be considered. The aim is to reduce energy and resource use throughout the entire life cycle of buildings and their components.

Academic partners, with whom the University of Luxembourg team has sound, lasting collaborations, will also play an important role as co-supervisors and potential secondment hosts. The project will thus strengthen the national [construction sector](#) and contribute significantly to promote the circular economy principles in Luxembourg. Doctoral candidates, especially those inclined to leave academia after their degree, will profit from the senior researchers' industrial backgrounds and networks and will be encouraged to consider options such as creating start-ups or spin-offs from any patents arising from their work.

Provided by University of Luxembourg

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