Innovative Strategies for High-Grade Material Recovery from Construction and Demolition Waste

Results in Brief

Recycling construction materials

Much of the waste in the construction sector can be reused or recycled for high-grade construction applications, but currently this is not the case. Novel technologies and products demonstrated within the scope of EU-funded research provide the motivation to do so.

Construction and demolition waste (C&DW) creates one of the largest waste streams in the EU. European Commission legislation (Waste Framework Directive) calls for a minimum recovery of non-hazardous C&DW of 70% by weight by the year 2020.

The EU-funded project ‘Innovative strategies for high-grade material recovery from construction and demolition waste’ (IRCOW) was designed to provide validated technical solutions considering the life cycle of the materials. Scientists identified barriers to reuse, including weak market structure, costs and quality of products.

To address the market issues, the team made policy recommendations. For example, increasing knowledge of potential applications of reused materials will instil confidence in the value of recycling. Including reuse as a component in public green
procurement will provide an incentive to do so.

Researchers developed tools to assist industry in implementing a recycling and reuse programme. The team delivered a demonstration version of an e-platform to facilitate and promote reuse practically. It has a stock-exchange tool at its heart and various areas covering topics such as proven best practices in various countries. An expert recycling tool assesses human and environmental risk factors associated with various recycling alternatives and is freely available.

IRCOW also created novel recycling technologies and a series of high-grade construction materials made from recycled C&DW. Automated sorting techniques, microwave thermal treatment and multi-layer composite extrusion are among the technologies successfully applied to a variety of materials, including plastics, gypsum and wood composites. These were turned into new products such as cement/chalk mixtures, multi-layer composite decking boards and multi-layer panels.

Five case studies at construction or demolition sites across Europe focused on different practical aspects of C&DW reclamation. They provided a test bed to determine which solutions are technically feasible, economically viable, environmentally appropriate and realistically applicable.

IRCOW's technological advances together with the validated business models and life-cycle assessments should help the European Commission reach its ambitious goals regarding reuse and recycling of C&DW. By developing better recycling processes together with novel products based on recycled C&DW, scientists have provided a win–win situation for the construction and demolition sector in the EU.

Keywords

Recycling, construction and demolition waste, waste streams, material recovery

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