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HISER contribution to policy and standardisation

Holistic Innovative Solutions for an Efficient Recycling and Recovery of Valuable Raw Materials from Complex Construction and Demolition Waste

Project duration: February 2015 – January 2019

The project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No 642085.

During the HISER project, leading companies representing European construction and demolition sector developed and demonstrated novel cost-effective holistic solutions for a higher recovery of raw materials from ever more complex construction and demolition waste (C&DW) by considering circular economy approaches throughout the building value chain (from End-of-Life Buildings to new Buildings).

Thanks to the great efforts made by all partners, HISER significantly contributed to the transformation of the European construction sector from linear to circular and environmentally-friendly approach. During the last four years, the HISER consortium elaborated, tested and validated a set of complementary technologies allowing the EU C&D sector to create the whole building value chain, starting from building demolition, going through crushing and recovering of the old building materials, ending with production of green, cost-effective building products made of the C&D waste.

Overview of project results

The most important products and services elaborated within HISER project:

- **Smart BIM-SD tool** that will help European demolition companies to quickly identify and quantify potential new raw materials through the smart processing of data. Smart BIM-SD provides users with harmonized inventories and supply chain tracking information with the purpose of identifying the most feasible and secure recovery options for the subsequent C&DW materials.
- **Innovative automated sorting and recycling technologies**, such as Advanced Dry Recovery (ADR), Electro-fragmentation technology, Laser induced breakdown spectroscopy (LIBS) and Hyperspectral Imaging (HSI). They adapt, integrate and enhance automated identification, sorting, selective electro-fragmentation and advanced comminution technologies, providing potential users with higher levels of certainty about the quality of secondary raw materials recovered from the demolished buildings.
- **New green and cost-effective building products** in which virgin raw materials are partially replaced by higher amounts of secondary high-purity raw materials recovered from complex C&DW. The HISER project partners propose a novel cost-effective products, among which green c**oncrete and cement**, **bricks** manufactured with a partial replacement of inert sand fraction by C&D recovered ceramic material, **VOC-absorbing plasterboards**, fire resistant **gypsum plasters**, **plasterboard composite panels** and extruded **composite structural products** can be found.

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Importance of Standardization and Certification

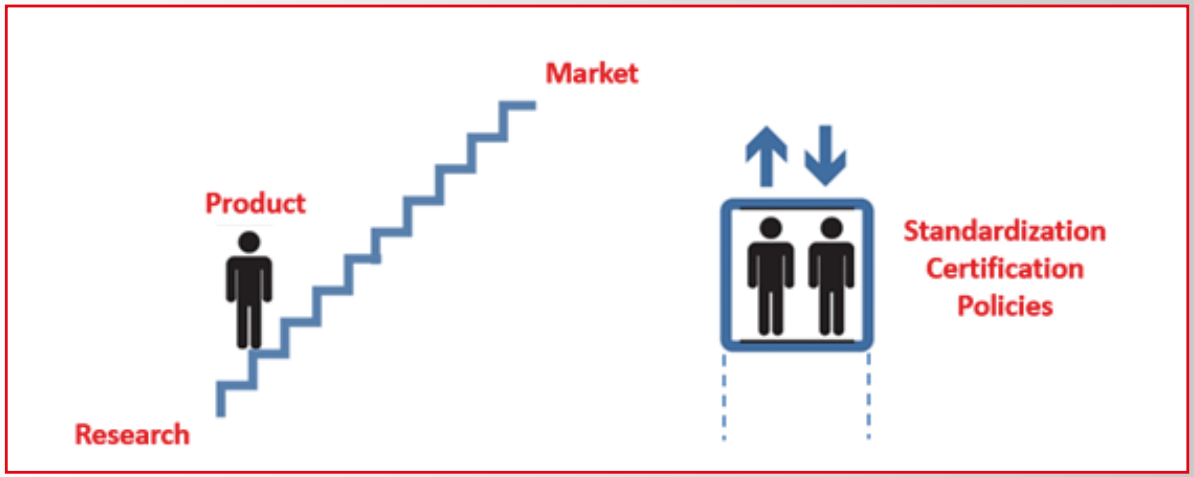
Standardization and **Certification** are increasingly recognized as important contributors to Innovation, which is one of the key drivers of EU growth. Specifically, they can help bridging the gap between research and the market, also supported by policy instruments that reward best practices and innovative solutions.

This is applicable to any economic field, including the construction sector explored by HISER project; while experiencing increasing complexity and more intense competitiveness, industries and SMEs have to put on the market innovative products bringing together safety, energy performance, resource efficiency, health and more in general sustainability, into an integrated, interoperable approach taking in consideration circular economy, climate action and the digital economy.

As innovation and research are strictly linked, a permanent dialogue between research and the European industry in key strategic sectors is necessary to strengthen the link and exchange of experiences between the involved stakeholders.

Together with science and research, Standards have an important role in innovation and supporting the market uptake of innovative products, as they enable knowledge transfer and support the shift from research to market, contributing to the competitiveness of the construction industry. As a “voluntary cooperation among industry, consumers, public authorities and other interested parties” standards need to be continuously implemented in order to collect gaps and unmet needs from the Stakeholders. The purpose of standardization is therefore to provide a reliable basis allowing people to share similar expectations of a product or service. This helps to:

- remove barriers by accelerating market access for new products and methods;
- assure safety and protection of health and environment;
- increase the compatibility and interoperability of products;
- promote common technical understanding by facilitating networking and synergies;
- enhance consumer protection and confidence.



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Standards recommendations in HISER

TThe research revealed the need for a strong strategy to promote the safety of CDW-derived materials, in order to stimulate consumer/user confidence, which would lead to greater promotion and use of these materials. Many opportunities (from standardization to certification and declarations) already exist in the European market for supporting the market uptake of innovative products, but many of them are still in pilot phase or under development, or have issues to be considered when applying for them (for example, the visibility of the product on the market and the related economic return, time and cost to get a certification, etc).

As a first step to underline the lack in standardisation and to overcome the existing barriers to the market uptake of innovative products from CDW, a workshop was performed together with AENOR and other stakeholders in Brussels in the context of the EU Raw Materials Week, offering to the participants the opportunity to discuss the state of the art and existing gaps for unmet needs in Standardization and Certification for innovative products. Possible further steps could be the implementation of the measures and strategies proposed within HISER Project.

It is necessary to increase the harmonisation and development of standards (including the simplification and integration of the latest developments based on existing technologies), new procedures and safety standards taking into account sustainability and energy efficiency aspects. CE marking with Basic Works Requirement (BWR) no. 7, ETA, EPD and ETV are possible opportunities which need to be conveyed in a common and homogeneous framework from a circular economy perspective, as they could transform markets towards sustainability, asking to industries but also to customers to go beyond standard practices and to generate demand for "best practice".

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Currently, it is widely acknowledged that there are numerous and different barriers for C&DW recovery and recycling and for the implementation of circular best practices within the construction sector.
A deep research has thus been performed to identify the main barriers and critical issues in order to tailor a set of policy recommendations, originated by HISER partners' expertise and HISER project experience, through an internal consultation process including policy Delphi study.

A considerable number of barriers to C&DW recovery and recycling have been identified along the steps of the buildings materials' cycle. Non-technical barriers cover a wide variety of areas and reflect the multiple perspectives to face this challenge. They are generally related to organizational and political, economic, socio-cultural and environmental aspects.

In response to such barriers, the HISER experience showed that acting since the **first steps of the waste-to-material chain** is crucial, as it deeply influences the final quality of the final recycled product.

Policy recommendations in HISER

Additionally, other urgent needs that arose from our investigation include the promotion of circular **economy** models by **cross-sectoral R&D efforts**, which can turn effective in supporting a large scale development of recovery of C&DW; the introduction of innovative **IT tools for data collection and for design and asset management**, which will improve waste traceability systems and will allow collection of design and service life information as support of end of life management and, finally, the development of **industrial technologies** to increase efficiency of recycling processes and/or quality of recycled products with respect to products manufactured from virgin materials. Transformations sought shall be also pushed by **economic** and **fiscal** measures, among which the introduction of incentives for the use of recycled materials (such as VAT reduction) and of landfill bans for recyclables fractions have been emerged as the most favourable.

As main outcome, our policy Delphi study – supported by an extensive desk analysis - led to the definition of a set of policy recommendations aimed at increasing C&D waste recovery from HISER perspective.

To download the HISER reports on Policy Recommendations and Strategy for measures to be undertaken towards Standardization and Certification please visit the project website www.hiserproject.eu.

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Project Partners

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