



iceberg

Circular Economy of Building Materials

Innovative Circular Economy Based solutions demonstrating the Efficient recovery of valuable material Resources from the Generation of representative End-of-Life building materials

28

Innovations

6

Circular case studies

35

Partners

10

Countries

15,6

Million of euros



David García Estévez (TECNALIA)

Understanding the problem

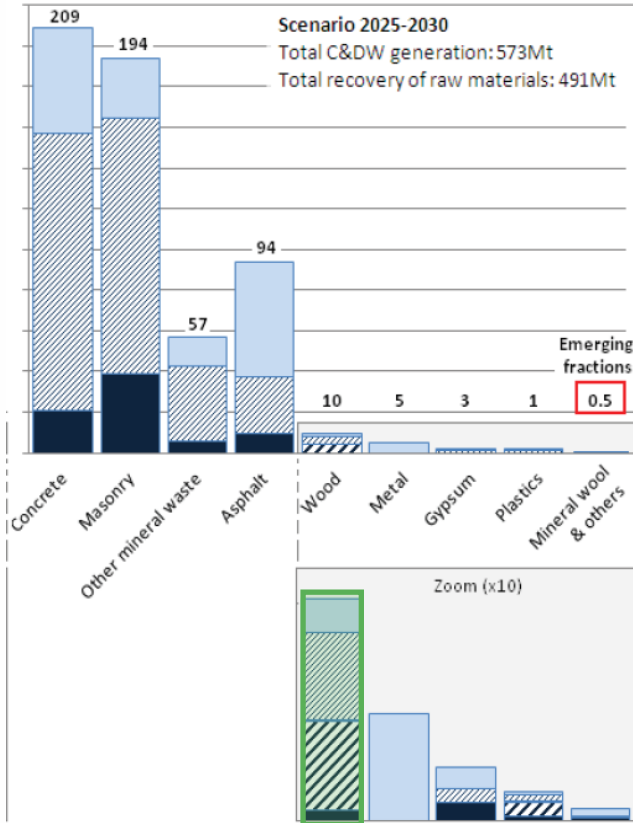
Construction, renovation and demolition waste (CDW) is one of the heaviest and most voluminous waste streams generated in the EU28 (350 Mt/year, excluding excavation waste).

Proper management of CDW and recycled materials can have major benefits in terms of sustainability and the quality of life. It also can provide major benefits for the EU construction and recycling industry, as it boosts demand for recycled building materials.

As part of a continuous effort towards a sustainable economy, the EC adopted in 2015 a new Circular Economy Package with measures prioritizing End of Life Building materials among others.

**Based on
volume, CDW
is the largest
waste stream
in the EU
(25-30%)**

Understanding the problem



HISER project (H2020, GA 642085)

EU Waste Framework Directive included a specific target to stimulate recycling: **70%** of non-hazardous CDW (by weight) has to be recycled or recovered by 2020.

The level of recycling varies significantly – from 10% to 90% - between the Member States.

CDW includes a wide variety of materials such as concrete, bricks, wood, glass, metals and plastic.

Some components of CDW have a high resource value, while others may have a lower value, but could still be easily reprocessed into new products or materials.

ICEBERG project

This project aims to develop and demonstrate **novel cost-effective circular smart solutions** for an upgraded recovery of secondary building raw materials along the entire circular value chain: from end-of-life building materials (EBM) to new building products prepared for circularity, resource-efficiency and containing 30wt% to 100wt% of high-purity (>92%) recycled content.

This will be undertaken through 6 pilot **circular case studies**, covering building materials accounting for more than 85% by weight of the European built environment.

ICEBERG will also contribute to raising **building circularity awareness** among the stakeholder communities (local authorities, professionals, students and final building users).

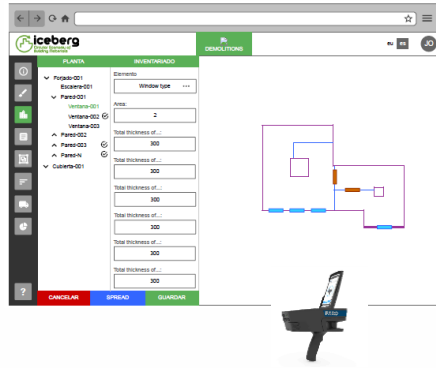


ICEBERG project: technologies



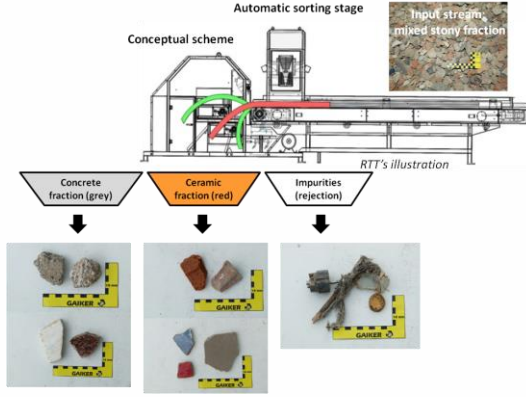
SMART SERVICES AND SOFTWARE

Sensors, artificial intelligence and blockchain to ensure greater information capture, process optimization and traceability to guarantee greater confidence in terms of quality throughout the value chain of resources and products for building.



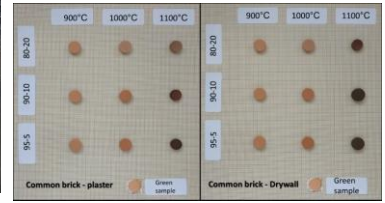
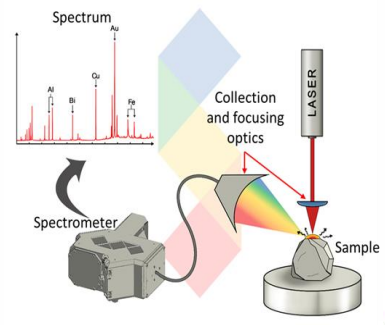
ADVANCED SORTING/ RECYCLING TECHNOLOGIES

Advanced technologies for the classification and purification of resources from the end of life of construction products.



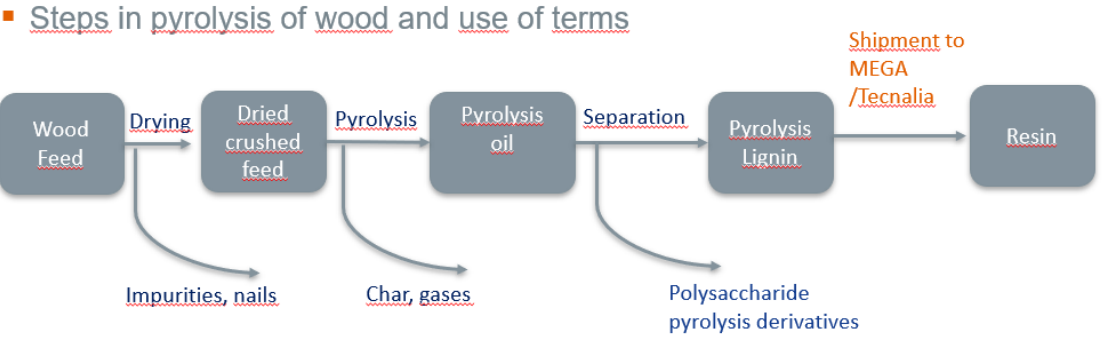
NEW CIRCULAR BUILDING PRODUCTS

Eco-design of new products and systems for building to incorporate the new criteria of circularity in the industrial manufacturing processes of the target products.



ICEBERG project: technologies on wood

- Sorting and comminuting solutions for wooden CDW
- Fast pyrolysis and purification process to obtain bio-oil from the lignin fraction of wood waste for subsequent production of biophenolic resin.



- Grinding and alkali treatment of recycled wood fibres customized for use in cement-based matrixes.



Hammer mill



Disc refiner



Double stream mill

ICEBERG project: case studies

ICEBERG solutions will be demonstrated (at TRL7) through **6 case studies** across different locations in Europe (Finland, The Netherlands, Belgium, UK, Spain/France and Turkey) representing most common European building typologies (residential and non-residential), execution practices and multiple building materials.

- Pre-demolition audit
- Selective refurbishment/demolition.
- Waste processing
- Production of new circular building products.
- Installation and use in representative building spaces.
- Demonstration of the new digital building materials traceability service.
- Simulation of easy-disassembly of the new building products in mock-ups
- Assessment of materials, energy and water consumption



ICEBERG project: Non-technical barriers

Health, environmental and economic assessment from life cycle perspective

Health assessment and mitigation of occupational risks related to the ICEBERG recycling technologies.

Evaluate the performance of the ICEBERG solutions in the 6 case studies regarding circularity, the environmental impact and financial cost.

Policy and standards recommendations

- Regulatory and legislative framework (waste management and landfill fees)
- Social attitudes
- Market confidence and acceptance of the recovered building materials and new building products designed for disassembly
- Business models
- Standards and European Technical Approvals.

ICEBERG consortium

tecnal:a
MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE

CSIC
CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS

BESE/INSART

CIMSA

ENVA

EPEA
PART OF DREES & SOMMER

colruyt

Gaiker
MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE

GBN

HACETTEPE UNIVERSITY

key
AEROGEL

KERABEN GRUPO

LENZ
INSTRUMENTS

Loughborough University

SAMEN MAKEN WE MORGEN MOOIER
OVAM

orbix

RAMPF
discover the future

RINA

British Gypsum
SAINT-GOBAIN

serikat »

ihobe
Instituto Tecnológico de Innovación y Medio Ambiente

SOPREMA

TU Delft

VTT

TEPE BETOPAN

TIIHONEN ISMO

tracimat

Universiteit Leiden

vito

MEGARA RESINS
ANASTASIOU FRANK S.P.A.

Viuda de Sainz

C2CA

LEZAMA
Denselicosas

PURKUPIHA

iceberg
Circular Economy of Building Materials



www.iceberg-project.eu

david.garcia@tecnalia.com



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869336