



REuse and REcycling of CDW materials and structures in energy efficient pREfabricated elements for building REfurbishment and construction

Would you buy a totally recycled house?

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RE⁴ Project

Project Description and Objectives

Background

- 868 million tonnes CDW generated in the EU in 2014 but insufficient material recovery
- Existing buildings were not designed for disassembly & reuse
- Prefabrication industry: up to 50% less waste than conventional construction practices

CDW recycling & backfilling (2014)

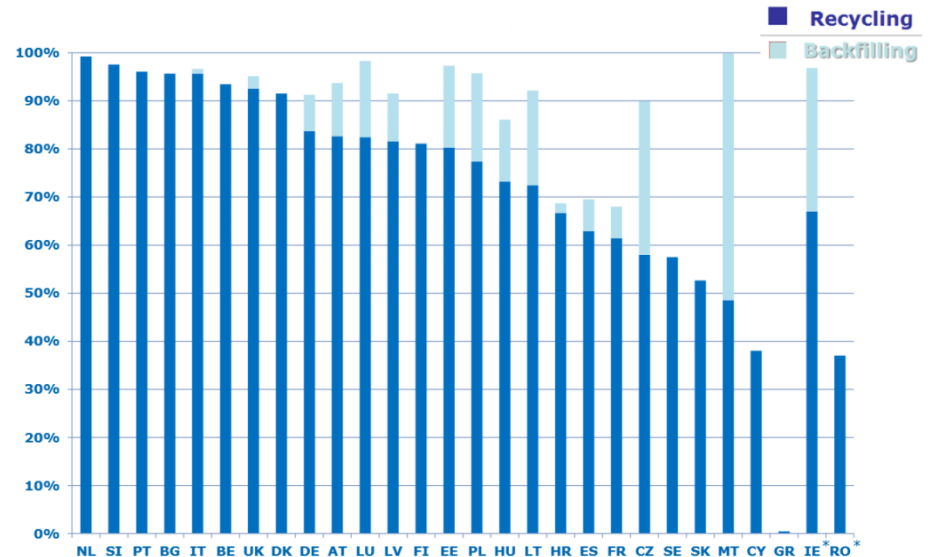


Chart: European Commission
Data source: Eurostat

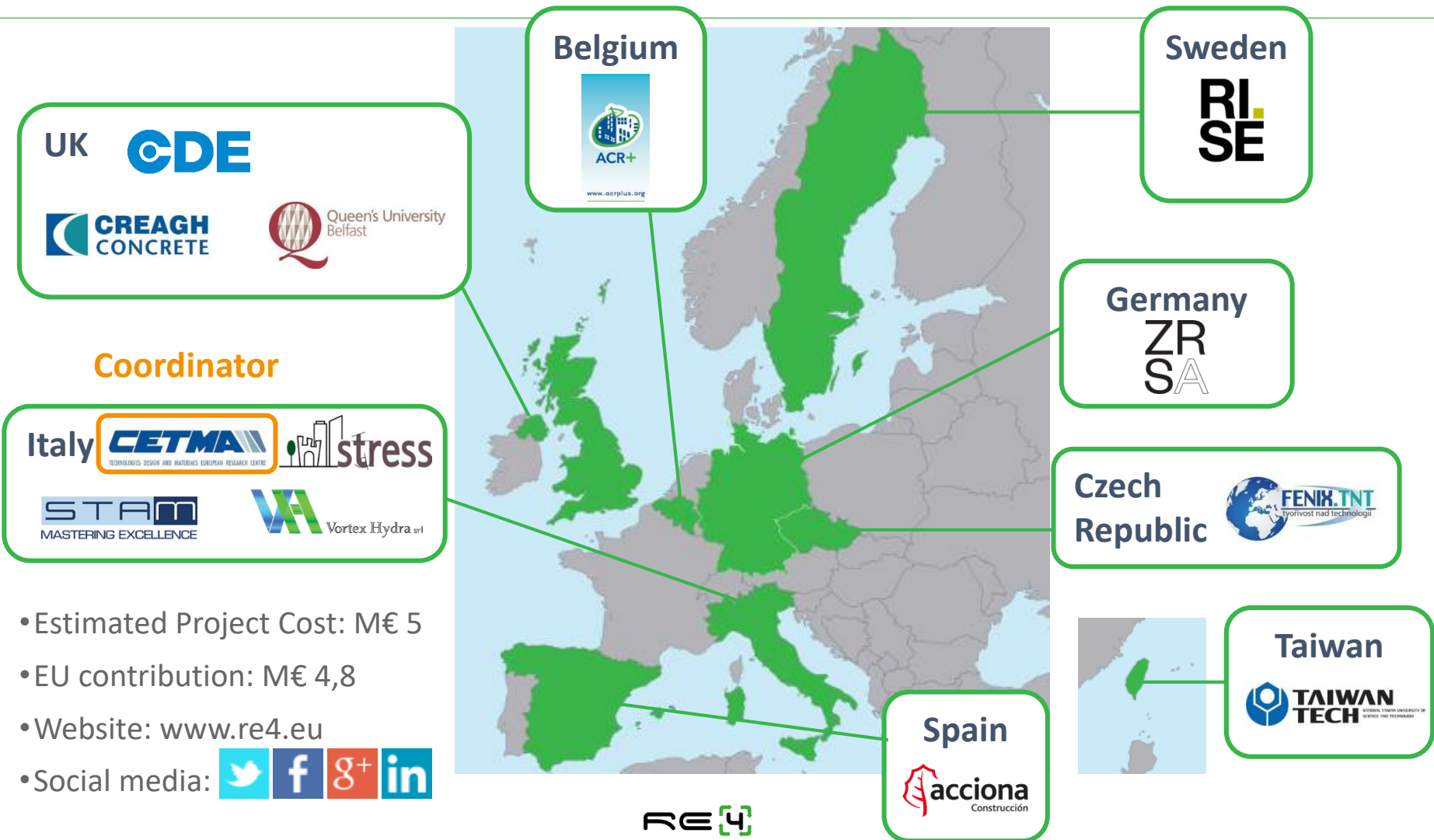
Motivation



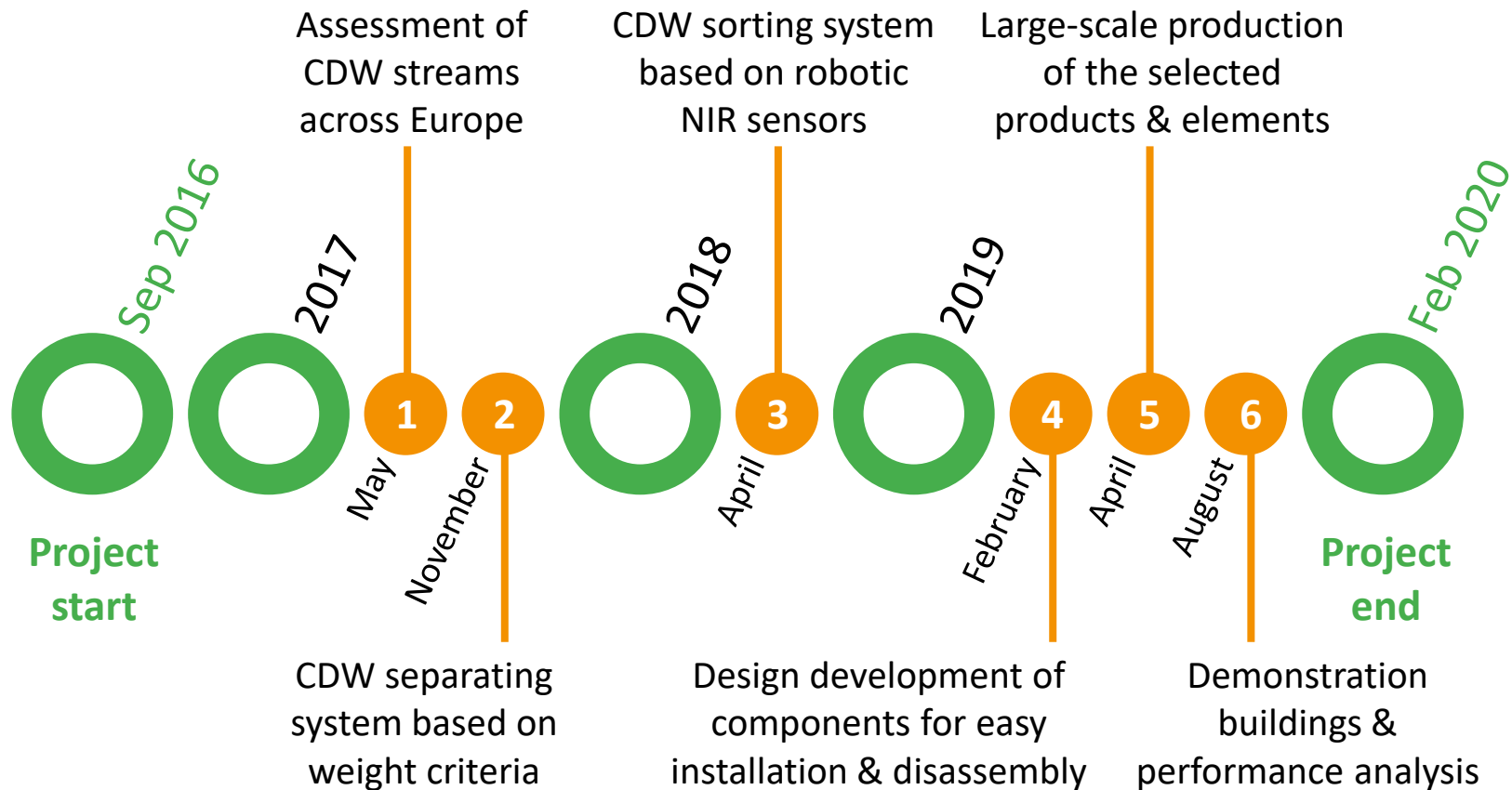
Development of innovative technologies & reliable strategies

- Increase % reuse & recycling from CDW
- Increase CDW technical & economic value
- Minimise future CDW from next generation of buildings
- Increase building energy efficiency

Project details and partners



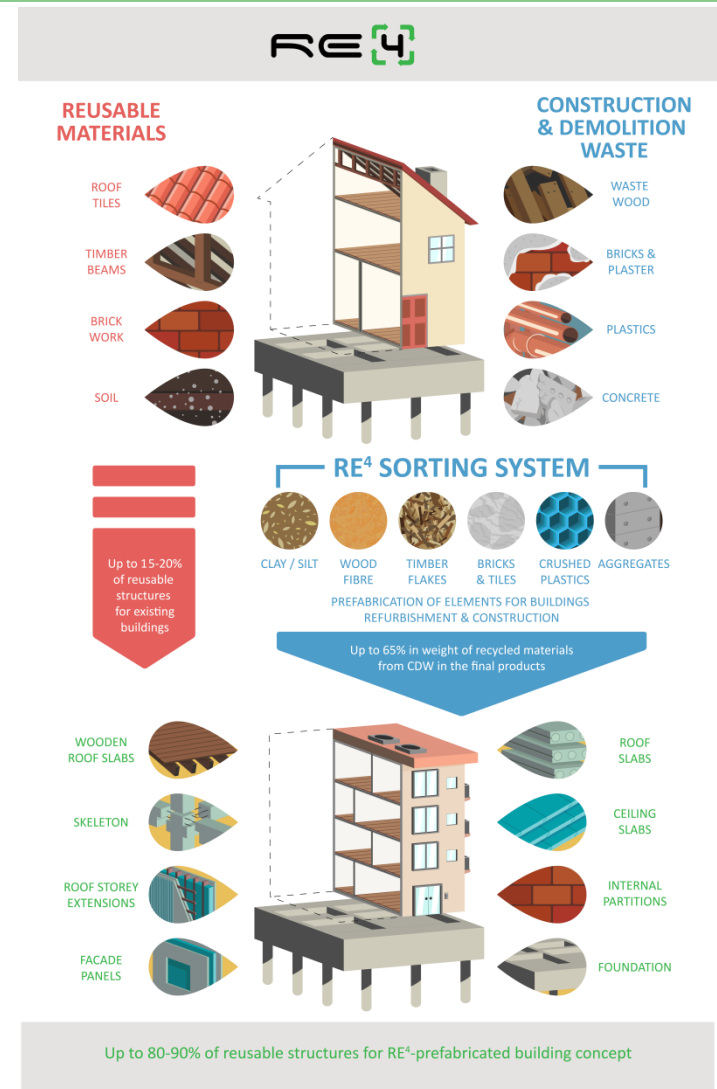
Timeline



Aim of the project

Develop a prefabricated energy-efficient building concept

- Easily assembled/ disassembled for future reuse
- Containing up to 65% by weight of recycled materials from CDW
- Reusable structures will range from:
 - 15-20% for existing buildings
 - 80-90% for the RE⁴ prefabricated building concept





RE⁴ Project

Main results

RE⁴ sorting system



RE⁴ robotic sorting system

- Increased recycling rate
- Increased quality of CDW aggregates
- Unlock recycling potential for unexploited materials like glass, plastics, brick, wood

RE⁴ structural components (concrete)



RE⁴ beams, columns (TRL7)



50-100%
CDW



100% reusable
(reversible connections)

RE⁴ structural components (concrete)



RE⁴ beams, columns (TRL7)



50-100%
CDW



100% reusable
(reversible connections)

RE⁴ structural components (concrete)



RE⁴ facade panels (TRL7)



50-100%
CDW



100% reusable
(reversible connections)

RE⁴ non structural comp. (concrete)



RE⁴ extruded panels (TRL7)



100%
CDW



100% reusable
(reversible connections)

RE⁴ non structural comp. (concrete)



RE⁴ sandwich panels (TRL7)



50-90%
CDW



100% reusable
(reversible connections)

RE⁴ non structural comp. (concrete)



RE⁴ blocks (TRL7)



100%
CDW



100% reusable
(reversible connections)

RE⁴ non structural comp. (concrete)



RE⁴ extruded tiles (TRL7)



85%
CDW



100% reusable
(reversible connections)

RE⁴ non structural comp. (timber)



RE⁴ facade panels (TRL7)



75%
CDW



100% reusable
(reversible connections)

RE⁴ non structural comp. (timber)



RE⁴ internal partition walls (TRL7)



75%
CDW



100% reusable
(reversible connections)

RE⁴ non structural comp. (timber)



RE⁴ insulating panels (TRL7)



100%
CDW



100% reusable
(reversible connections)

RE⁴ fully reversible prefab buildings





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Please visit our website www.re4.eu
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