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RE^4 Project

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

D9.4 Second Short Interim Management Report
Public summary of deliverable

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Distribution[2]	This document is a public summary of the confidential deliverable D9.4
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Abstract:	The document reports on the status of activities performed in RE^4 Project from M7 (Mar 17) until M12 (Aug 17). It provides a short but meaningful synopsis for each WP in progress, reporting: overview, main obtained results, deliverables produced, activities planned for the next 6 months (M13/Sep 17-M18/Feb 17), deviations and corrective actions (if any).
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[1] Just mention the partner(s) responsible for the Deliverable
[2] PU: Public, RE: restricted to a group specified by the consortium, CO: Confidential, only for members of the consortium; Commission services always included.
[3] Draft, Revised, Final

Purpose and scope

The **Deliverable D9.4** (*Second short Interim Management Report*) belongs to the *Reporting to the EC Task (T9.4)* of the *Project Management Work Package (WP9)*. In accordance with the art. 20 of the Grant Agreement, the European Commission established 3 Reporting Periods (RPs) of the Project (RP1: from M1 to M18, RP2: from M19 to M30 and RP3: from M31 to M42). In addition, short Interim Management Reports have to be provided (in M6, M12, M24, and M36).

The D9.4 reports on the status of activities performed until M12.

Summary of the work done in the period (M7-M12)

According to the Description of Action (DoA), in the second semester of the project, Tasks 1.3, 3.1, 4.2 and 8.1 were completed and 8 out of 8 Deliverables foreseen within M12 were regularly submitted (D1.2 *Statistics assessment,* D1.4 *Overview on the current status on policy measures and regulatory frameworks,* D1.5 *Certification framework,* D4.2 *Geometrical, physical and chemical characterisation of CDW-derived materials,* D8.5 *Use of economic instruments,* D8.6 *Market Assessment,* D9.4 *Second short Interim Management Report and D10.1 EPQ Requirements N.1*) and 2 out of 2 Milestones foreseen within M12 were regularly achieved (MS1 *Availability of the CD waste streams across Europe*, verified by means of the availability of D1.1 *Data collection on CDW* and D1.2 *Statistics assessment;* MS5 *Availability of comprehensive characterisation of CDW derived materials for their recycle or reuse,* verified by means of the availability of D4.2 *"Geometrical, physical and chemical characterisation of CDW-derived materials")*.

No deviations occurred during the reference period with respect to timing and activities progress, and the mid-term targets in M12 were fully met.

Explanation of the work carried out in the period (M7-M12) per WP

WP1 Mapping and analysis of CDW reuse and recycling in prefabricated elements (WP leader CETMA)

The main objective of Work Package 1 is to define a collective outline and map the current best practices related to various aspects of reuse and recycling of CDW in prefabricated elements (including technological, standardization issues and policy measures).

During the second semester of the project, three reports have been prepared during the reference period and regularly submitted in M9 (D1.2, D1.4, and D1.5). *D1.2 – Statistics assessment* contains a comparison between D1.1 data and other studies published after the submission of D1.1. *D1.4 – Overview of the current status on policy measures and regulatory frameworks* outlines EU policy and regulations about CDW materials, prefabricated elements with or without recycled materials from CDW and prefabricated constructions, with a focus on the market situation. *D1.5 – Certification framework* contains a factsheet including all certification issues for the prefabricated elements that will be developed in RE^4.

WP2 Strategies for innovative sorting of CDW and reuse of structures from dismantled buildings (WP leader STAM)

The main goal of Work Package 2 is to study innovative sorting solutions for the recycling

of CDW and strategies for the reuse of structures from dismantled buildings.

During M7-M12 period, Tasks 2.2, 2.3, 2.4 and 2.5 were carried out. In particular, Task 2.2 dealed with the definition of a sustainable dismantling strategy for buildings, while Tasks 2.3 and 2.4 were developing an innovative separating and sorting system for CDW, based on weight and spectral response of different materials. Moreover, Task 2.5 developed a Decision Support Software compatible with BIM (Building Information Modelling) data, to estimate and manage the CDW amounts.

WP3 Innovative concept for modular/ easy installation and disassembly of eco-friendly prefabricated elements (WP leader ZRSA)

Work Package 3 is focused on the development of innovative design concepts for an energy efficient building.

During the second reporting period, the work in WP3 was mainly focussed on the further development of the design concept of a fully recycled, dismountable new residential building. Initial architectural plans to match a modular grid of structural elements were further developed. A number of different solutions was investigated and a list of requirements for the façade elements that will be developed by the involved partners wa s defined.

WP4 Technical characterisation of CDW-derived materials for the production of building elements (WP leader QUB)

Work Package 4 is mainly focused on establishing the quality of CDW-derived materials and assessing the compliance of each sorted fraction against relevant National and European specifications for the production of buildings elements.

During the second 6-month period, the task 4.2 was successfully completed and D4.2 was submitted in M11. The report focuses on geometrical, chemical and physical characterization of different sorted CDW fractions, supplied by CDE from recycling centres in Southern and Northern Europe. Task 4.3 started in M9 and focused on the analysis of variability of the chemical-physical features of CDW-derived materials and effect on technological properties of developed products. Moreover, project efforts were devoted to the development of alkali activated binders from sorted brick and tiles waste.

WP5 Development of precast components and elements from CDW (WP leader CBI)

Work Package 5 is focused on the development of robust materials with a high level of incorporation of CDW and prefabricated components and elements from these materials, which can be easily installed and disassembled.

The work done in the second reporting period concentrated on Task 5.1, 5.2 and 5.3. Task 5.1 is dedicated to the development of materials incorporating CDW, Portland cement and alkali activated binders. Much efforts was on mortar scale tests until basic properties were under control, followed by concrete screening tests, designed to quickly find the optimized mix design.

The replication of RE^4 approach outside EU was performed in Taiwan by NTUST. Several recipes were properly designed and tested.

Task 5.2 focused on the development of prefabricated components: building blocks, reconstituted tiles, timber beams and columns (structural support system) and weatherboarding, and insulation panels. Initial work on development of building blocks

and semi-dry mix started. Activities on reconstituted tiles by moulding and extrusion have been planned. Initial work on timber beams and columns was on a review of locally available material (full beams or parts of beams from construction sites and other sources). Furthermore, collection of timber material was conducted. For insulation panels, work was conducted on the typology of the timber panels that will be produced, and procurement of the right type/size of plastic material (rigid plastic) to perform preliminary tests.

Task 5.3 is devoted to the development of Development of prefabricated elements. Most work was focused on the compilation of different structural and non-structural elements to be produced in the project, including connections, production techniques (moulding and extrusion) and types of reinforcement, as well as suitable test methods.

WP6 Pilot level demonstration of CDW based prefabricated elements (WP leader ACCIONA)

Work Package 6 is focused on demonstration and validation of prefabricated elements designed in WP3 and developed in WP5 for new energy efficient buildings and for refurbishment of existing buildings.

WP6 will start officially in M18. However, a telco meeting among involved partners was organised to discuss topics concerning WP2 and WP6.

WP7 Life-cycle and HSE analysis and certification/standardization strategy definition (WP leader STRESS)

Work Package 7 is focused on all the aspects related to environmental (LCA), social (LCSA), health and safety impacts, cost analysis (LCC) and certification issues connected with the RE4 solutions, with the aim of addressing and evaluating their sustainability, reducing time to market and contributing to improve market and social acceptance.

WP7 is focused on all the aspects related to environmental (LCA), social (LCSA), health and safety impacts, cost analysis (LCC) and certification issues connected with the RE^4 solutions, with the aim of addressing and evaluating their sustainability, reducing time to market and contributing to improve market and social acceptance. WP7 will start officially in M13 with Task 7.2. However, partners were involved in the definition of the questionnaire for the LCA data collection, as well as for the collection of LCA data regarding conventional construction materials / components / elements.

WP8 Training, dissemination and exploitation (WP leader FENIX)

The main goal of Work Package 8 is to define appropriate measures for managing dissemination and exploitation of the Project results.

WP8 is dealing with dissemination, communication and exploitation activities of the project results. In this reporting period, 2 deliverables were submitted (D8.5 and D8.6). *D8.5 Use of Economic Instruments* analyses the performances of the CDW management systems in Europe and the use of economic instruments. *D8.6 Market Assessment* was prepared by FENIX as market assessment of the European market of CDW recycling and reuse in order to ensure that the developed RE^4 solutions will be accepted by end users and enable successful market penetration. In addition several tasks were carried out: the

website and social network profiles continuous update and maintenance.

WP9 Project Management (WP leader CETMA)

The goal of Work Package 9 is to ensure that the Project meets its objectives within the budget and scheduled timescales.

Due to its own nature, WP9, is devoted to run the Project. The Project Coordinator (PC) is responsible for the overall management, communication, and coordination of the entire Project. The PC's tasks include: supervision and approval of reports and technical deliverables, first liaison and communication with the EU Institutions, monitoring of the progress of the Project according to the work-plan, ensuring that the technical objectives of the Project as a whole are met, budget controlling, reporting of the major changes from the agreed work-plan to the PMC (Project Management Committee). The PC is supported by CETMA's technical team.

WP10 Ethics requirements (WP leader CETMA)

Work Package 7 is focused on the "ethics requirements" that the project must comply with.

In this reporting period, CETMA finalised the Deliverable D10.1. The primary scope of D10.1 was to:

- provide further information about the possible harm to the environment caused by the research and state the measures that will be taken to mitigate the risks. This should include a list of the potentially hazardous substances and how their levels will be monitored, as well as evidence of conformity with local, national and EU laws regarding the handling, storage and disposal of said substances.
- ensure that appropriate health and safety procedures conforming to relevant local/national guidelines/legislation are followed for the staff involved in this Project. Where applicable, certification allowing handling of hazardous materials (HAZMAT) must be provided, as well as a description of relevant training courses for staff involved in these activities.

Activities planned in the next period (M13-M18)

Activities planned for the next 6 months (M13-M18) foresee the submission of 6 deliverables (D2.2 *Deconstruction strategies and building structure reusability,* D2.3 *Weight and size-based CDW separation methods,* D4.3 *Effect of the variability of CDW batches,* D5.1 *Material development,* D8.7 *Initial Exploitation Plan,* D8.8 *IPR manual*) and 1 milestone (MS2 *Weight-criteria based CDW separating system,* that will be verified by means of the availability D2.3 *"Weight and size-based CDW separation methods" and the system itself).*

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