InnoWEE project will focus on the development and field tests of new high performance pre-fabricated geopolymeric panels made with a large content of recycled CDW for outdoor and indoor building walls.

The different and combined solutions will be assessed in terms of energy efficiency and environmental sustainability, cost-effectiveness in manufacturing and installation, market potential and exploitability. The products will have different characteristics and a high performance like low or high thermal transmittance in function of the application, high fire resistance, lightness, high mechanical robustness, enhanced surface properties. Affordable costs of these solutions will be ensured by the low formulation costs due to the use of recycled waste materials and by the easier and faster installation/removal practices. Moreover, the raw materials used and the associated production technologies will contribute to the reduction of embodied energy and the CO2 emission during manufacturing and installation.

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**OBJECTIVE**

**ACTIVITIES**

**WP1. Identification of the waste typologies and their use in new construction material**

Main objective of WP1 is the identification and categorization of the CDW typologies collected in Europe. Their performance will be analyzed in laboratory and a production line will be set up for treatment of CDW. Moreover, existing European and national standards, codes and guidelines will be identified and updated. Based on these assessments a performance indicator for the efficiency evaluation of the new materials will be established and environmental performance analysis (LCA) will be conducted. Finally the first preliminary business model will be developed.

**WP2. Development of the new materials including different construction waste and performance evaluation in laboratory**

The activities will be focused on the definition of the design of geopolymer binder, and on the development and assessment (physical/mechanical characteristics) of the prototypes of new eco-friendly insulating façade and radiating panels.

**WP3. Production definition and scale up of new panels**

The technical plant design and production steps of geopolymeric components will be established in order to upscale eco-friendly insulating façade and radiating panels, set up small scale production of panels for demo site applications and assess industrial production.

**WP4. Selection of the best technical solutions, energy performance and project design**

The best solution for an easy installation and disassembly of panels based on architectural and costs evaluation will be identified. The solutions will be optimized by modelling the energy performance of the different scenarios. This will permit to elaborate the project designs for each demo building.

**WP5. Demonstration and validation in field, performance evaluation and scenarios**

The selected solutions will be installed in 4 buildings: a pilot demo case, a new, an existing and a historical building. This will permit the evaluation of the performance and durabilty in field with respect to energy efficiency, durability and comfort. Results will be monitored in compliance with national/European standards, codes and guidelines for all demo sites. The innovative products will be compared with the traditional ones in term of installation time and costs. Moreover, their performance will be evaluated in a large European scenario.

**WP6. Business models, market introduction plan and future impact**

This WP will define the production and installation methods for a large scale application and capital costs of ownership. A final business plan with respective risk assessment and sensitivity analysis of data will be developed. Furthermore, the costs vs performance during the whole life cycle (LCCA) will be evaluated. Exploitation plans for different European markets centred on SME interests will be developed, and a Life Cycle Thinking (LCT) approach will be used for supporting environmentally sound decision for waste management.

**WP7. Dissemination exploitation and communication activities**

The main actions in this WP includes setting-up and maintenance of a web site, wide dissemination of the outcomes towards stakeholders, promotion of the project among the academic community, governments, policy makers, designers and engineers, energy efficiency social housing, definition of a training plan, development of training material and training of end-users, assurance of knowledge exchange and easy communication among the partners, as well as between partners and stakeholders.

**DEMO SITES**

Athens, Greece

Bucharest, Romania

Padua, Italy

Mechelen, Belgium

Bilbao, Spain

Padua Italy

Athens Greece
InnoWEE

Elementi prefabbricati innovativi contenenti rifiuti da costruzione o demolizione (CDW) di diversa tipologia per la riduzione del consumo energetico dell'edificio e per minimizzare l'impatto ambientale.

Lo scopo principale del progetto InnoWEE è lo sviluppo di un ottimale riutilizzo dei materiali provenienti dai rifiuti da costruzione e demolizione (CDW) per produrre pannelli prefabbricati isolanti e radianti ad alto valore aggiunto da utilizzare in edifici ad alta efficienza energetica.

Il progetto InnoWE si basa su:

- **Recupero**, separazione, selezione e trattamento dei CDW.
- **Sviluppo** di nuovi pannelli geopolimerici prefabbricati ad alte prestazioni per l'isolamento e per il riscaldamento/raf-frescamento di ambienti.
- **Fabbricazione** di un prodotto che sia conveniente, competitivo, robusto, affidabile ed a bassa manutenzione.
- **Creazione** di soluzioni costruttive pratiche e sostenibili facili da integrare nel design degli edifici.
- **Valutazione** delle prestazioni dei nuovi pannelli in siti dimostrativi caratterizzati da differenti condizioni climatiche.

**CONTATTI**

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Rivolto ai seguenti argomenti del Work Programme:
EEB-04-2016 Nuove tecnologie e strategie per lo sviluppo di elementi prefabbricati attraverso il riutilizzo e il riciclaggio di materiali e strutture da costruzione.

Progetto numero: 723916
Costo del progetto: 3.36 milioni di €
Durata del progetto: 4 years

**I PARTNER**

COORDINATOR CNR-ISAC, Italy
CNR-ITC, CNR-ICMATE, Italy

Advanced Management Solutions, Greece
R.E.D SRL, Italy
Tecnalia Research & Innovation, Spain

Guidolin Giuseppe - Eco. G. srl, Italy

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Slovenian National Building and Civil Engineering Institute, Slovenia
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