

The logo for CETMA, featuring the company name in a bold, blue, sans-serif font with three vertical bars of varying heights to the right.

Civil Engineering Area

A photograph of a modern building under construction, viewed from a low angle looking up. A crane is visible against a blue sky with light clouds. The image is framed by a thick orange border.

“Key enabling technologies
for a better and more sustainable
future”

KNOWLEDGE ACQUISITION AND TRANSFER

❖ EUROPEAN PROJECTS

- New research lines
- Building new skills
- New materials development
- New components development
- -----

❖ SERVICE CONTRACTS

- Concrete companies
- Precast companies
- Bio-blocks or components companies
- Reuse production waste or residues
- -----

KEY EXPERTISE IN CONSTRUCTION MATERIALS

**Circular Economy
& Environment**

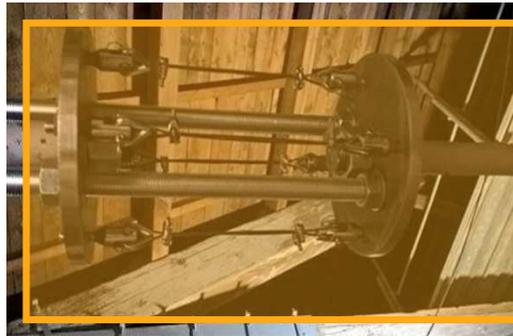
**Buildings &
Infrastructures**

Diagnostics

Cultural Heritage



**Construction
materials & components**



**Structural reinforcing &
seismic protection**



Smart materials & SHM



**Non-destructive
diagnostics &
assessment**

DCE LABS



#1 BUILDING LAB



#2 NON-DESTRUCTIVE TESTING LAB



#3 STRUCTURAL HEALTH MONITORING LAB



Lab #1

BUILDING LAB



- Equipment for the geometrical, mechanical and **physical characterization of aggregates**
- **3 concretes and mortar mixers** (drum and pan mixers)
- Equipment for the **Physical and mechanical characterization** of fresh and hardened **concretes and mortars** (compression strength, indirect tensile strength, elastic modulus, flexural strength)
- **Mechanical testing** of FRC beams and plates
- Pull-off and DSS test equipment for **FRP reinforcement**
- **Environmental chamber** (1000 l)
- **Thermal Conductivity Test Tool**



Focus on

ECO-SUSTAINABLE PRODUCTS

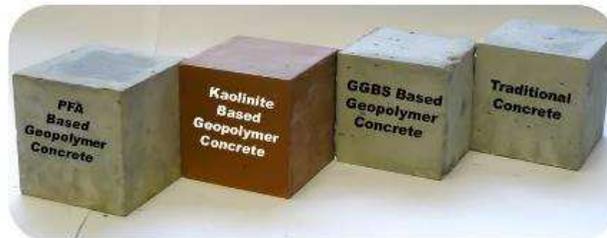
- Development, optimization and prototyping of eco-sustainable materials and components made of all waste materials (aggregates and binders)
- Development and optimization of Alkali Activated Materials (AAM)
- Mix design of normal and lightweight concretes, fibre reinforced concretes, nano additivated concretes, Phase Changing Materials (PCM) additivated concretes
- Optimizations of concrete properties (i.e. in terms of rheology, workability, density, compressive strength, durability, insulation)

Materials studied as aggregates

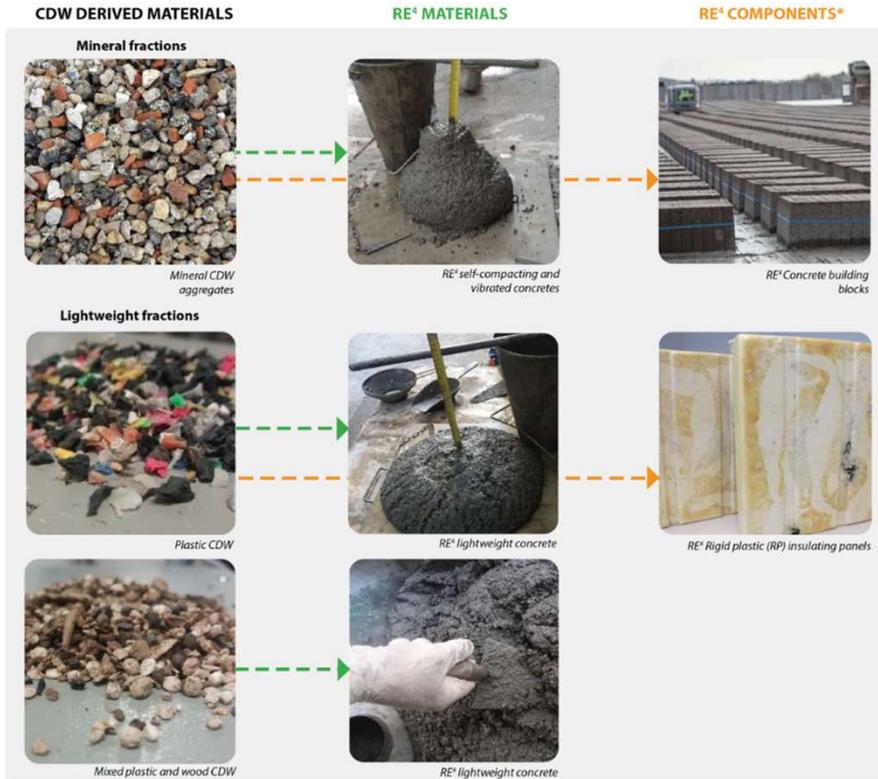


- Mixed plastics
- PUR
- Glass
- Rubber (PFU)
- CDW
- Industrial waste
- Marble and gypsum powder
- Wood
- RAEE
- Agro-waste (hemp, miscanthus, almond shells, olive stones, rice husks)

Binders



- Low CO₂ cement
- Geopolymers/AAMs
- Gypsum



RE⁴ - REuse and REcycling of CDW materials and structures in energy efficient pREfabricated elements for building REfurbishment and construction

GOAL

Maximize the reuse and **recycling of CDW-derived materials** and structures from dismantled buildings

RESULTS

- Increase the quality of CDW-derived materials and structures
- Development of an up to 90% reusable, energy efficient, pre-fabricated building incorporating up to 65% of materials and structures from CDW and up to CO2 reduction > 30% & Energy saving 20%



MAREWIND - MAterials solutions for cost Reduction and Extended service life on WIND off-shore facilities

GOAL

To increase materials durability, sustainability and recyclability of offshore wind energy structures

CETMA'S RESULTS

- synthesis of more durable construction materials for offshore foundations (AAM's)
- Structural Health Monitoring activities by means of fiber optics integration
- blade reinforcement by experimenting the use of recycled carbon fibers
- new recyclable materials development for blade manufacturing



i-ClimaBuilt - An open innovation test bed for building envelope materials – Pilot line for the development of insulating building solutions with recycled materials

GOAL

Production of insulation materials/components utilizing wastes. Support for characterization and testing activities.

CETMA's RESULTS

- ✓ Optimization of a LWC fully based on **recycled mineral/plastic aggregates**
- ✓ Manufacturing of LWC-based construction components incorporating an insulating foam from mineral wastes
- ✓ Innovative insulating blocks installed on an external façade in one demonstration building of the Project (Spain)



Exploit4Innomat - An Open Innovation Ecosystem for exploitation of materials for building envelopes towards zero energy buildings

GOAL

Exploit4InnoMat project is stepping up with a unique Open Innovation Testbed, helping developers and companies test in real-life settings next-generation building materials, such as aerogel coatings and 3D-printed components. From flexible facades to energy-efficient roofs, the project brings science closer to the streets.

CETMA's RESULTS

- Development and production of **cement-free insulating panels** with a high percentage of **recycled materials**
- Monitoring the properties of the panels installed in the lighthouse of the SINTEF partner in Norway



Le' Colaz - Building an Adaptable Future Brick by Brick through A Comprehensive Framework for Circular, Secure, and AI-Optimized Sustainable Construction

GOAL

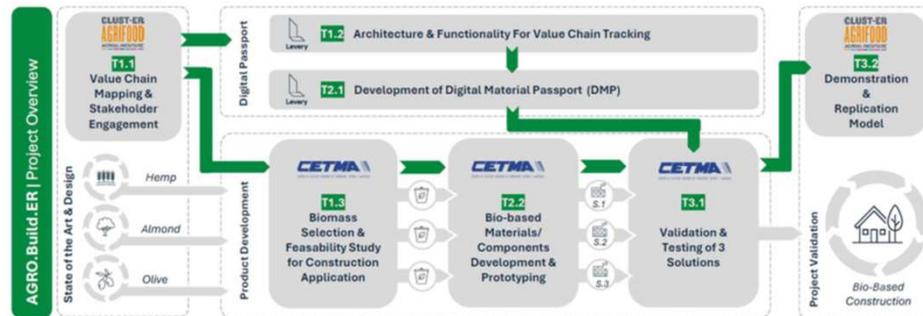
The Le' Colaz system redefines construction and renovation by integrating innovative tools, products, and techniques to enable adaptable, circular, and sustainable building practices. Inspired by “LEGO bricks,” its modular framework combines bio-based and recycled materials with advanced snap-fit components, designed for seamless assembly, disassembly, and reuse.

R&D ACTIVITIES

Development of sandwich facade blocks/panels that integrate **recycled construction and demolition waste (CDW)** with phase-change materials (PCMs) to enhance thermal performance and sustainability. The panel will consist of a core layer of lightweight concrete incorporating CDW-derived aggregates for mechanical strength and thermal mass, along with insulation layers made from **recycled polyurethane** enriched with PCMs to provide thermal regulation and energy storage capabilities. Prototype development involves the fabrication of full-scale facade panels/blocks designed for easy snap-fit integration.

25-040 AGRO.BUILD.ER

❖ Bio-based materials / components with agro-waste



25-091 BIO.CORN.ER



Regional subcontractors:



RI.COS.

Regional service provider



Regional stakeholder



❖ Bio-based mortar

- HEMP
- MISCANTHUS

**23-093
MISBLOCK**



**24-029/030
SUNRICE**



- RICE WASTE

- GYPSUM

**23-023
INDECAL**



**24-219
DIGI4BIOMAT**



- HEMP
- ALMOND SHELLS
- OLIVE STONES