

## ReNaturalNZEB – Recycled and natural materials and products to develop Nearly Zero Energy Buildings with low carbon footprint

### Summary

The main objective of the project is to demonstrate and promote solutions for buildings with nearly zero energy needs through the incorporation of natural and/or recycled components and, therefore, contribute to reducing the energy or carbon footprint associated with buildings.

Since 35% of the EU's greenhouse gas emissions are linked to constructing and living in buildings, there is high demand for the development of more energy efficient building methods and more environmentally sustainable building materials. The ReNaturalNZEB LIFE project will show that components made from natural and recycled substances can reduce both the cost and carbon footprint of new and renovated buildings. In addition to reducing greenhouse gases embodied in building materials by 60%, the new lightweight structures can reduce internal energy demand by up to 80%. As part of the project, 10 technology prototypes are being built and tested onsite in Portugal and Spain.

### Main objectives:

- To develop a construction model of nearly zero energy low-cost buildings with low carbon footprint using green and circular economy criteria.
- To introduce sustainable construction materials and technologies "close to the market" such as kenaf insulation, rice husk composite materials and biomass ash in concrete structures.
- To promote sustainable construction technologies with low market rates in Spain and Portugal such as wood structures, windows and finishes, compressed earth block structure, cork insulation, olive kernel biomass, clay wall panels and sustainable green roof/façade.

- To build 10 prototypes (2000 m<sup>2</sup>) in existent and new constructions with natural and recycled technologies selected in the project.
- To produce technical documentation, regulations, recommendations and urban regulations for the renovation of buildings to promote the use of construction technologies based on recycled materials and reduce embodied energy in construction.
- To decrease the environmental impact of buildings, through the use of recycled and natural materials.
- To decrease the energy demand in buildings using envelopes that incorporate recycled and natural materials.
- To disseminate the proposed technologies.
- To promote nearly zero energy buildings implementation in Portugal and Spain.



Figure 1. Ribera del Fresno demonstration case.



Figure 2. Examples of nature-based construction materials.



### Project Reference

LIFE17 ENV/ES/000329

### Leading Institution

Junta de Extremadura (Spain)

### Partners

CICYTEX – Centro de Investigaciones Científicas y Tecnológicas de Extremadura (Spain), INTROMAC – Instituto Tecnológico de Rocas Ornamentales y Materiales de Construcción (Spain), UCO – Universidade de Córdoba (Spain), URVIPEXSA (Spain), Itecons – Instituto de Investigação e Desenvolvimento Tecnológico para a Construção, Energia, Ambiente e Sustentabilidade (Portugal), LNEG – Laboratório Nacional de Energia e Geologia (Portugal)

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### CERIS Research Team

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EU LIFE Programme

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2018-2024

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2 062 125.00€

### CERIS

Coimbra Hub: 178 814.00€

### Project Website

<https://www.liferenatural.com/en>