Partners

The PLURAL project is based on the cooperation of 18 partners from 7 European countries - Greece, Spain, Germany, Czech Republic, Poland, Switzerland and Luxembourg.

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PLURAL

PLUG-AND-USE RENOVATION WITH ADAPTABLE LIGHTWEIGHT SYSTEMS

HORIZON 2020 RESEARCH PROJECT

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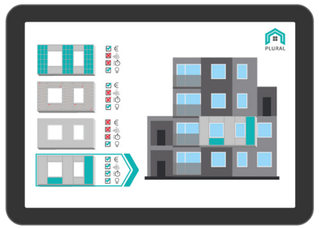
Introduction

Reduction of energy consumption, emissions and carbon footprint of buildings is vital in meeting the EU´s climate and energy targets for 2030. The Near Zero Energy Building concept requires a high level of energy efficiency, in combination with on-site renewable energy production and use. It is evident that improving the energy performance of buildings calls for retrofit/renovation actions that not only meet the energy and environmental targets, but also ensure minimum disturbance of the inhabitants and indoor comfort. The PLURAL project aims to tackle this challenge by developing "Plug-and-Use" kits for fast and energy efficient deep retrofitting.

Concept

The aim of PLURAL project is to develop and demonstrate “Plug-and-Use” kits. The key is to understand how to select and integrate various renewable energy technologies, incorporate them in prefabricated façade components and optimize their performance for different building types, climates and socio-economic conditions. PLURAL focuses on how to manufacture these kits while minimising energy use and material waste.



Objectives

The PLURAL project aims to design, validate and demonstrate a palette of versatile, adaptable, scalable, off-site prefabricated plug-and-play kits that account for user needs, thus named “Plug-and-Use” (P-n-U) kits”.

NEAR ZERO ENERGY CONSUMPTION

Heat losses through the envelope will be minimized through improved insulation of the façade components, (U values < 0.23 W/m^{2}K; Building primary energy consumption < 60 kWh/m^2).

COST-EFFECTIVE

About 58% reduction in renovation costs will be achieved through offsite prefabrication, lean manufacturing and construction interactively supported by the BIM based platform and Decision Support Tool.

FAST RENOVATION

At least 50% reduction in the time required for deep renovation mainly by reducing the time to design, procurement, logictics, fabrication and site preparation from avg. 5-7 months to 2-4 months.

ENVIRONMENTALLY - FRIENDLY

Deep renovation aiming at reduction of CO2 emissions to reach 15% less than the current average 0.6 tCO2eq/m2 and additionaly to achieve 70% material recyclability.

FLEXIBLE

System combinations will allow easy adaptation of the PnU kits to be developed and validated as part of the project to various residential building typologies in all EU climatic zones.

Demonstration

The PLURAL concept will be integrated at three different residential building sites, located in **Greece, Spain and the Czech Republic**, featuring different climate conditions and heating/cooling needs and user requirements, thus demonstrating the versatility and robustness of the overall concept.

Additionally, PLURAL includes three virtual building demos in **Switzerland, Germany** and **Sweden** for simulating and validating the performance and operation of the solutions under further conditions. The real demonstrators will also be used for their virtual assessment under conditions that differ from the actual ones. The results will be used for establishing best available techniques and guidelines regarding all implementation phases, including shipping, installation, maintenance and decommissioning.