

## Envelope Approach to improve Sustainability and Energy Efficiency in multi-storey multi-owner residential buildings

**Designing innovative retrofitting solutions** 

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Residential buildings dated between 1925 and 1975 were constructed



in an era when there was little or no consciousness of the need to design for energy efficiency and thus they have the largest energy demand.

A large part of this existing stock still needs to be insulated and the vertical envelope is the key point to achieve energy efficiency. EASEE addresses this issue by developing a new holistic approach for the envelope retrofitting based on innovative technical solutions for:

- The outer envelope
- The cavity wall
- The interior face of external walls

This will ensure a significant reduction of energy demand as well as of the discomforts for the occupants during retrofitting, thanks to the use of dry construction processes.

## Standard solutions to be replicated

- Innovative pre-fabricated panels with built-in insulation, reproducing the aesthetic of the original facade.
- A new range of insulating inorganic materials for the cavity wall based on natural and synthetic perlite.
- Innovative insulating solutions for the internal walls, based on a combination of technical textiles, coatings and high performance plasters.
- A Retrofitting Planner (in development), providing specifications for component manufacturing as well as information on the best combination of retrofitting solutions for the specific building in terms of initial investment, expected savings, performances etc.



## Showcasing the solutions through pilot cases



- EASEE is close to finishing the research activities related to the innovative retrofitting solutions developed within the project.
- Two test façades at the POLIMI campus in Milan have been identified in order to represent a test bench for the innovative construction components installation. Dedicated monitoring systems have already been installed on both of them with the aim of monitoring the building performance before the retrofitting interventions.
- During the project, two large scale demo buildings (one in Milan, Italy, and one in Gdansk, Poland) have been targeted to validate the retrofitting approach on a large scale. Two other demo buildings in Prague and Madrid for reduced scale assessment are under definition. These buildings, being located in different climatic zones,<sup>©</sup>wwill allow effective demonstration of the proposed retrofitting approach in terms of installation and energy performance in use.



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