

IMPACT

The proposed solution for building retrofitting should lead to **50% reduction** of primary energy needs and significant CO₂ emissions reduction. The main target of E2VENT system is the market associated to the retrofitting of **multistorey residential buildings** built in the 60's 70's. Those buildings are found in all Europe and can be characterized by their insulation weakness, bad air quality due to the lack of air renewal system and low architectural interest.

PARTNERS



CONTACT

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HORIZON 2020 RESEARCH PROJECT

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WWW.E2VENT.EU



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Energy Efficient Ventilated Façades

Energy Efficient Ventilated Façades for Optimal Adaptability and Heat Exchange enabling low energy architectural concepts for the refurbishment of existing buildings.



INTRODUCTION

E2VENT project is developing a cost effective, high energy efficient, low CO₂ emissions, replicable, low intrusive, systemic approach for retrofitting of residential buildings, able to achieve remarkable energy savings, through the integration of an innovative adaptive ventilated façade system, including:



Smart modular heat recovery unit which improves Indoor Air Quality while minimizing energy losses



A latent system using PCM that allows thermal storage mode for the reduction of energy consumption peaks



Cost-effective, easy to install, high performance adapted products for external thermal insulation



A smart building management system enhancing the user experience and allowing future adaptability

RESULTS ACHIEVED SO FAR

The **E2VENT system** is an external thermal building refurbishment solution with an external cladding and air cavity. The elements composing the E2VENT system were developed - the two heat exchangers embedded in the E2VENT module evolved from concept to design and now first prototypes:



A Smart Modular Heat Recovery Unit (SMHRU) for the air renewal allowing the heat recovery from extracted air using a double flux exchanger.



A Latent Heat Thermal Energy Storage (LHTES) based on phase change materials providing a heat storage system for heating and cooling peak saving.



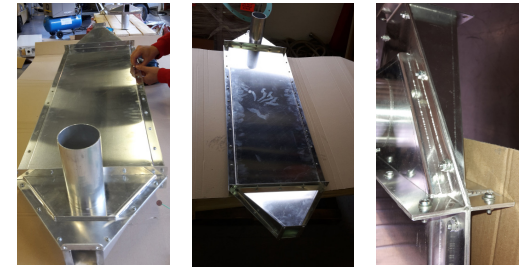
A smart management system that controls the system on a real time basis targeting optimal performances is currently under development. It will embed new sensors, communicate with existing systems and recover predicted weather.



An efficient anchoring system that limits thermal bridges and allows an easy and durable installation.

PROTOTYPES

The SMHRU provides the air renewal with an air flow that is determined by regulations. Thus the LHTES is not designed for the air renewal but only to store the external potential energy in order to use it for heating or cooling. Therefore it can be seen as a complementary system with high performance for heating and cooling especially aiming at reducing the peak loads.



SMHRU prototype



LHTES prototype

DEMO SITES

Prototypes performance will be firstly tested on the façade test bench of Nobatek (Anglet, France). Two pilot buildings will be renovated with E2VENT systems - Gdansk (Poland) and Burgos (Spain), in order to test the system in two different climates. To assess the impact of the E2VENT module, the energy performance of the demo buildings is being evaluated before retrofitting. The two buildings have been monitored for six months measuring electricity and gas consumption as well as indoor environment quality parameters. It will permit to establish the energy consumption baseline for comparing the new consumptions after renovation and then for establishing the savings. The renovation with the E2VENT module will be implemented in March 2017.



Façade test bench of Nobatek



Demo building in Burgos, Spain



Demo building in Gdansk, Poland

