IMPACT

The proposed solution for building retrofitting should lead to **50% reduction** of primary energy needs and significant CO_2 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.

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WWW.E2VENT.EU

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European Commission

E2VENT

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 CO_2 emissions, replicable, low intrusive, easy to install, 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 for the air renewal which improves IAQ while minimizing energy losses

A Latent Heat Thermal Energy Storage using PCM that allows thermal storage mode for the reduction of energy consumption peaks

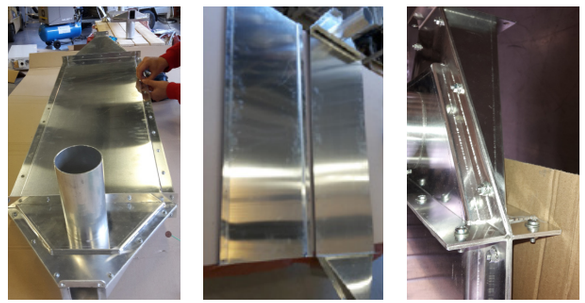
An efficient anchoring system that limits thermal bridges and allows an easy and durable installation

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

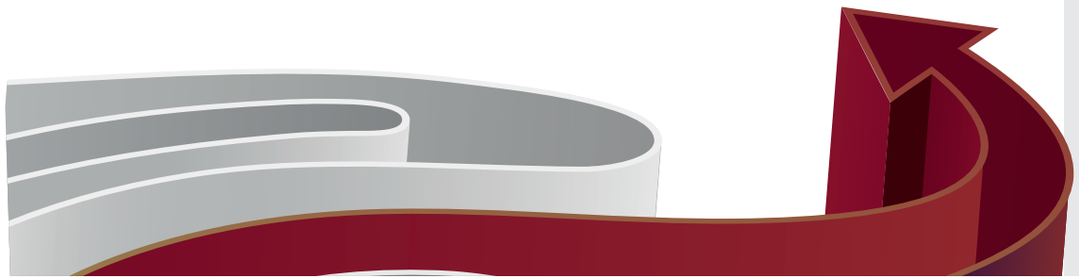
SMART MODULAR HEAT RECOVERY UNIT (SMHRU)

- heat recovery from the extracted air using a double flux exchanger
- Indoor Air Quality ensured while limiting the energy losses
- aluminium-made to be lighter and with good thermal conductivity

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



LATENT HEAT THERMAL ENERGY STORAGE (LHTES)

The LHTES system improves the capacity of the building to store heat. This system using phase change materials (PCM) takes the advantage of temperature gap between daytime and nighttime to maintain the thermal comfort within the recommended range. Acting as a cooling device, the LHTES stores energy during cold night and discharges it during the day in order to cool down the associated thermal zone.

LHTES prototype

The LHTES is composed of 3 main parts:

1. The casing made by ELVAL COLOUR
2. A metallic frame that holds LHTES to the wall
3. The PCM heat exchanger

The LHTES system fits into a casing that is made of Etalbond produced by ELVAL COLOUR, partner of the project. The casing allows the air tightness of the system that is crucial for its efficiency. The dimension of the casing are 800 mm width, 2500 mm of height (that corresponds to a floor to floor space) and 150-180 mm of thickness. There are no elements that weigh more than 30 kg so that it can be easily maneuvered.

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 retrotting. 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