

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



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HORIZON 2020 RESEARCH PROJECT

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WWW.E2VENT.EU



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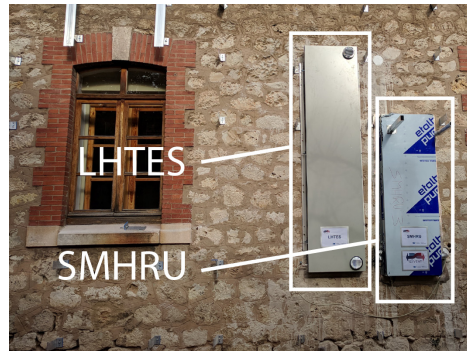
Energy Efficient Ventilated Façades

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



INTRODUCTION

The **E2VENT system** is an external thermal building refurbishment solution for retrofitting of existing residential buildings, able to achieve remarkable energy savings, through the integration of an innovative adaptive ventilated façade system. The E2VENT system includes:



LHTES and SMHRU at demo site in Burgos

- A Smart modular heat recovery unit (SMHRU) for the air renewal allowing the heat recovery from the extracted air. Indoor Air Quality is ensured while minimizing the energy losses.
- A Latent Heat Thermal Energy Storage (LHTES) based on phase change materials providing a heat storage for heating and cooling peak saving
- A Building Energy Management System (BEMS) for controlling the system on a real time basis targeting optimal energy performances.
- An efficient anchoring system minimizing thermal bridges and allowing an easy and durable installation

DEMO SITES

The E2VENT projects is approaching its final stage and at this point is important to demonstrate the prototypes at the project demo sites. Prototypes performance was firstly tested on the façade test bench of Nobatek in Anglet (France) in February 2017. By the end of the year 2017, two demo buildings were renovated in different climates – one in Burgos (Spain) and second in Gdansk (Poland). To assess the impact of the E2VENT solution, the energy performance of the demo buildings was monitored for six months (electricity, gas consumption and Indoor Air Quality parameters).



ANGLT TEST BENCH



BURGOS DEMO SITE

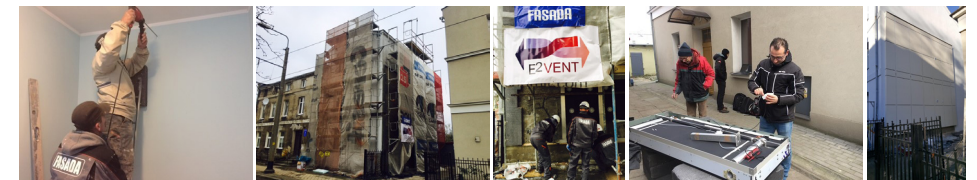
The building is located in the University of Burgos and it is composed of two rooms (computer lab and classroom) with high internal heat loads which imply a need of air renewal and cooling. The renovation design corresponds to the installation of three SMHRU units and two LHTES units for a total ventilated façade to be installed of 250 m².



The first step of the renovation consisted of the installation of the HVAC systems on the façade and commissioning regarding their correct functioning. The first day corresponded to the fixation to the wall, the second one to the settings and functioning tests especially regarding piloting, and the third one to commissioning when airflow and noise levels were measured.

GDANSK DEMO SITE

The second building, in Gdansk, needed to be renovated because of its low energy performance and low air quality inside the flats that was confirmed by monitoring. E2VENT solutions were demonstrated on two -flats. The elements composing the design were two SMHRU, two BEM systems, the ventilated façade (40 m²) of Etalbond panels, and ETICS façade (120 m²). The SMHRU and ventilated façades were manufactured in Greece in ELVAL while the BEM system was manufactured and calibrated by CARTIF in Spain. Then all the components were sent directly to Gdansk to FASADA premise.



The first step of the renovation process was marking and drilling of the holes for the installation of SMHRU units in the flats. It was crucial to place the ventilation units in such way that they can work properly, and they are fitting the internal furniture location. The works were performed by FASADA in cooperation with other project partners (Tecnalia, Cartif, Nobatec, and Acciona). Important part of the commissioning process were acoustic tests performed, these tests were done in order to find the maximum speed of the ventilators that generates noise that is in agreement with existing acoustic standards. All the tests were performed according to technical standards.

