

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



E2VENT project presentation

Event name

Presenter name, company

This project is supported by the European Commission
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E2VENT Project



Months
project



Partners



8 Work
packages



3,4 Million
budget

- E2VENT is 42 months research project funded by European Commission under the **Energy Theme of the Horizon 2020** for research and Technological development.
- Focus on developing an energy efficient ventilated façade system for the refurbishment of existing **residential multi-storey buildings**, i.e. a modular adaptable system embedding heat exchange and heat storage units to reach optimum energy performance.



Introduction



- **Old buildings** (vast majority of the building stock) are predominantly of low energy performance and subsequently in need of refurbishment work.
- Within the existing European building stock approximately **34% of the multi-storey residential building** stock is built in the **60's 70's** → only few or no requirements for energy efficiency, characterized by:



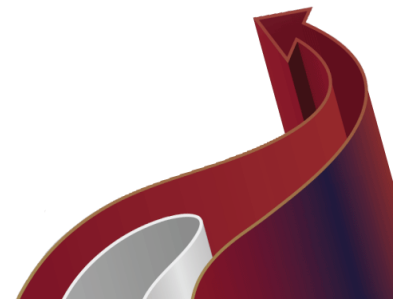
high energy losses through the envelope and high energy consumption



low indoor air quality mostly related to humidity that can lead to a deterioration of the health of the end user



poor aesthetics, and a need for maintenance



Introduction



- E2VENT develops, demonstrate and validate 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



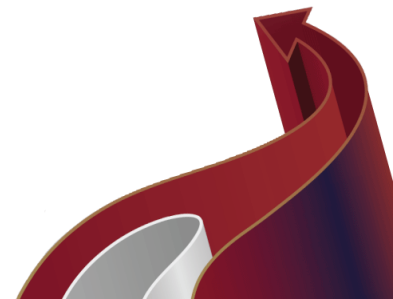
A latent system using PCM that allows thermal storage mode for the reduction of energy peaks



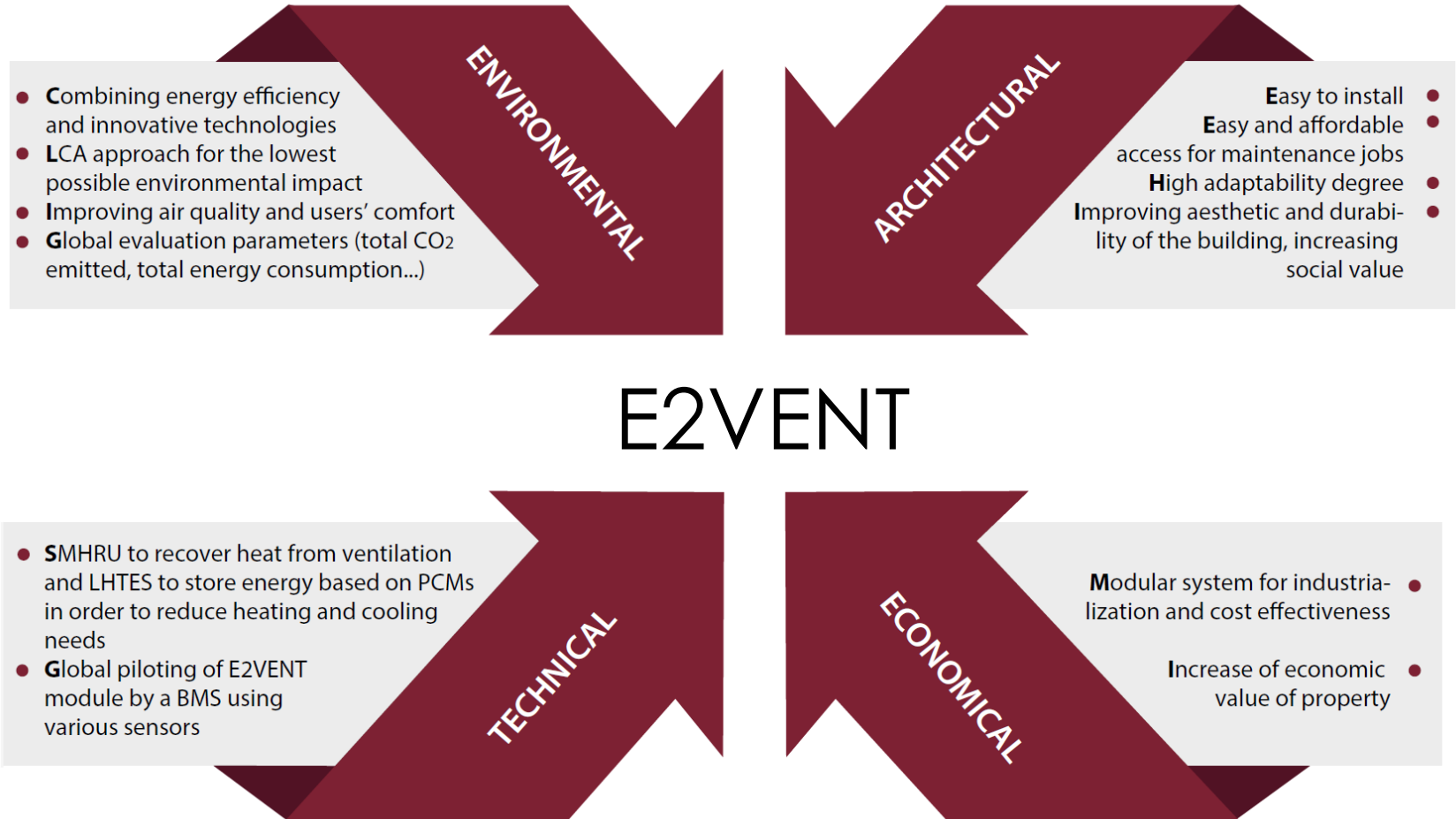
Cost-effective, easy to install, high performance adapted products for external thermal insulation



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



Objectives

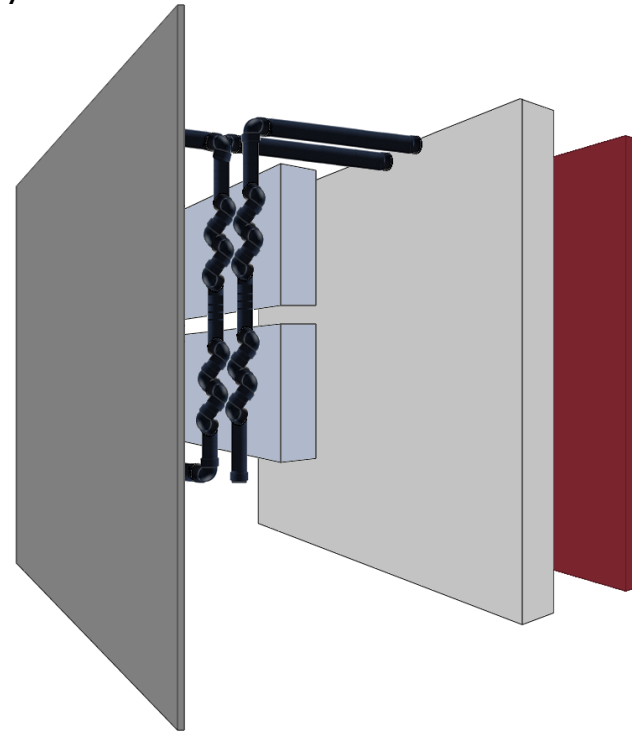


Concept

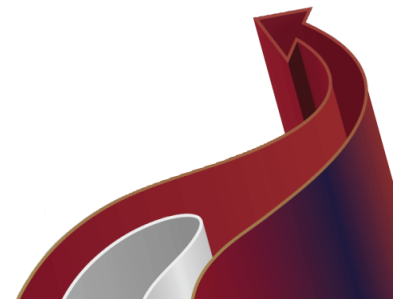


The E2VENT system is an external refurbishment solution with external cladding and air cavity that embeds different breakthrough technologies ensure its high efficiency:

- **A Smart Modular Heat Recovery Unit (SMHRU)** for the air renewal allows the heat recovery from the extracted air using a double flux exchanger. Indoor Air Quality is ensured while limiting the energy losses.
- **A Latent Heat Thermal Energy Storage (LHTES)** based on phase change materials will provide a heat storage system for heating and cooling peak saving.



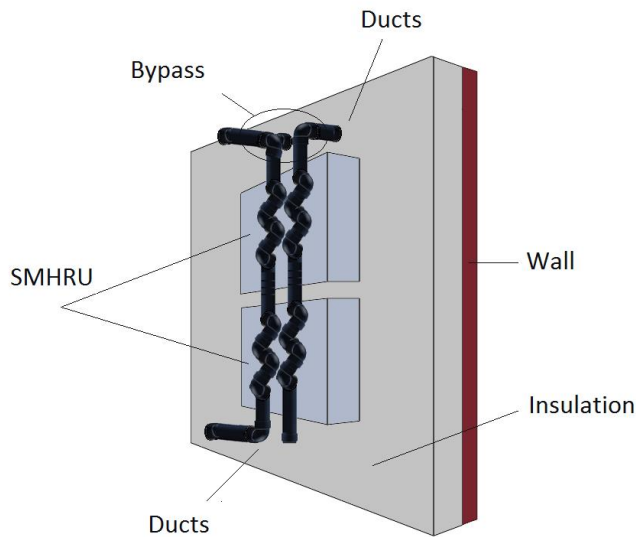
E2VENT system



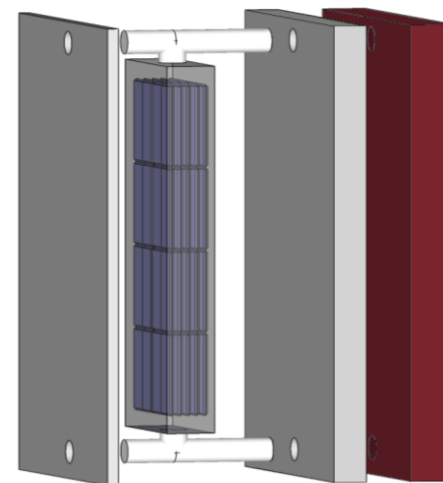
Concept



- **A smart management** that controls the system on a real time basis targeting optimal performances. 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.



SMHRU Smart Modular Heat Recovery Unit



LHTES Latent Heat Thermal Energy Storage



Demonstration



- Prototypes performance firstly tested on the future façade test bench of **Nobatek**.
- Two pilot buildings renovated with E2VENT systems (Poland and Spain) in order to test the E2VENT system in two different climates.
- During the monitoring the potential users, financiers, and partners will be consulted to develop a solution matching market needs.



Façade test bench of Nobatek in Anglet, France



Demo building in Burgos, Spain



Demo building in Gdansk, Poland

Prototyping



- **SMHRU** is novel as it is a very thin double flux exchanger that can be integrated in a renovation module. The theoretical efficiency that has been calculated is over 90%, although we expect that the measured one will be lower (around 80%) due to practical reasons. **An efficient anchoring system** that limits thermal bridges and allows an easy and durable installation.



- **LHTES** includes custom-made tubes made in aluminum in order to ensure the PCM encapsulation. This encapsulation allows a better heat exchange between the air and the PCM as the surface is large and the conductivity very high, and thus a higher efficiency for the overall system.



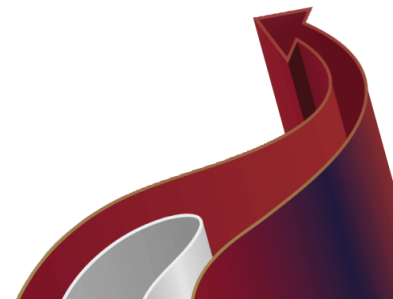
Test Bench in Anglet



- The test bench allows installing the systems on a **2,6 m high and 2,7 m width** wall associated to a cell that is fully equipped with HVAC systems and measurements, allowing to assess the energy performance of those systems on the associated zone. Another cell with an identical wall has been renovated with an ETICS and serves as a business reference. The performance of the two renovations will be compared.



- 01 The start of the installation on the BEF wall 02 SMHRU during the assembling 03 SMHRU on the BEF cell
04 Installation of the LHTES on the BEF cell 05 Global view of the LHTES and SMHRU on the BEF wall.



Partners



The logo for nobatek, with "nobatek" in a grey sans-serif font and "nobatek" in an orange sans-serif font.

Project Coordinator, Test Bench



Demonstration, monitoring & validation



Relation between research project and aluminium industry

The logo for FASADA, with the word "FASADA" in white capital letters on a blue rectangular background.

Functional design, construction of Gdansk demo site



Exploitation & market strategy manager



Leader of the elements development



Eco-design & architectural Integration manager



Thermal modelling of the heat exchanger



Dissemination manager



ARISTOTLE
UNIVERSITY OF
THESSALONIKI

Requirements & Specifications manager



Testing, Demonstration, monitoring & Validation



Burgos demo site & building materials



Architectural integration & aesthetics consideration

Contact



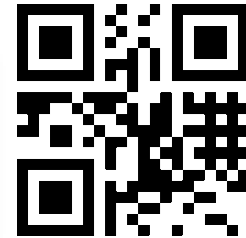
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