

A smart facade that saves energy and reduces bills

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Imagine a hot climate in a residential building at noon: the shutters are down. There is no breeze but the air is not stifling. This is possible thanks to a ventilated façade that circulates fresh air saved the previous night.

Now, imagine the scenario of in a [cold climate](#) at midnight, when the [ambient temperature](#) is below zero. The same technology can make the façade return heat absorbed from sunlight during the day.

Such technology can bring residents welcome relief. Indeed, people living in places with extremes of temperatures may find it difficult and expensive to maintain a certain level of comfort.

Now, imagine that the technology also saves nearly 30% on heating bills and up to 10% on the cost of [air conditioning](#). These are typical values for advanced passive solar technologies and these figures represent the energy-efficiency targets of the European project MeeFS .

The researchers are developing two new retrofitting units for [energy absorption](#) and ventilation, which are currently being tested in a social residential building in Mérida, in Extremadura, Spain.

"Our first goal is to make residents optimally comfortable. And they will also have the advantage of reduced energy bills", says Isabel Lacave, architect at the eco-efficiency group of Technological Centre of ACCIONA Infrastructure, based in Madrid, which designed and

produced the energy absorption unit.

"We will install an algorithm control which will monitor both the inside, the outside and the air ventilation unit through sensors to switch the units on or off during hours when it is required and in the best conditions according to the weather," explains Julen Astudillo, the architect at the technological division of Tecnalia, responsible for the design and development of this unit.

One expert explains the advantages of the approach. "Solar passive technologies greatly contribute to reduce the thermal demands due to two effects: They have an insulating effect and they create favourable thermal layers close to the building envelope. For example, air circulation in ventilated solar façades or cooler air layers due to evaporation in green façade modules," says Herena Torio, a renewable energies engineer, researcher at the Institute of Physics, at the University of Oldenburg in Germany. "This second effect might also contribute to improve the comfort conditions for the user inside the building, influencing not only their energy bills, but also their well-being," says Torio.

Despite these advantages, some concerns remain, including the aesthetic impact. "We are trying hard to design according to the best aesthetic requirements. But this is an acute transformation. So residents need to be informed right from the start about what they can expect to see in front of their apartments," says Lacave. Residents have been informed by the government of Extremadura about all of the advantages of reduced energy costs and assured they will not be disturbed by the retrofitting.

Some residents have been asking about the possible appearance of fissures on the envelope. Lacave assures that tests of potential structural and mechanical problems caused by different weather conditions, such as hurricane-strong rain and wind as well as fire, have already been

carried out.

There are some other added advantages to such [technology](#). Adding to comfort, the ventilation system can be personalised for each resident. Astudillo explains: "The system will choose the best option at any time. But residents will be able to change the mode to disconnect it and simply open the window, if they want to get some light or fresh air." Such freedom of operation should help win residents over.

With a real map of these needs on their hands, Astudillo's team will be able to decide in which parts of the building to install each automated sensor. "It is really important to explain to inhabitants all the changes that we are going to implement to get real acceptance by the neighbourhood," concludes the architect.

Provided by Youris.com

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