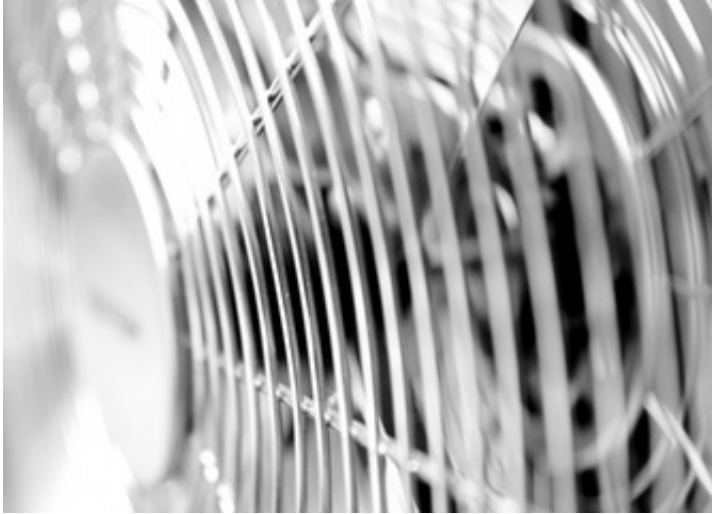


Air conditioning control goes wireless

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Scientists devised a new wireless and energy autonomous sensor network using in collective buildings to monitor heating, ventilation and air conditioning and reduce energy consumption

The quest for [energy efficiency](#) has become a modern mantra. But developing [new energy sources](#) and production methods is not sufficient. The emergence of [intelligent systems](#) to control, reduce and rationalise [energy consumption](#) is also getting the community of scientists excited. Now, the Tibucon research project, funded by the EU, developed a [wireless sensor network](#) for heating, ventilation and [air conditioning](#) (HVAC) in buildings.

"The Tibucon solution is using a network of self-powered wireless sensors monitoring the thermal conditions of buildings," says researcher Jeroen Van der Veken from project partner organisation Thomas More Kempen College, in Geel, Belgium. Its advantage is that it completely avoids the use of cables and does not increase the buildings energy consumption as sensors are powered using solar energy or energy provided by the lighting in the room.

Experts see the benefits of this [sensor network](#). "Installing wireless systems is much less expensive than the use of wired systems," says Roland Debruyne, Ghent-based former president of the Belgian HVAC professional federation ICS, and member of the technical committee of the Belgian building research institute WTCB. What is more, "avoiding the use of batteries [in the sensors] is also useful, as many people forget to reload or change them in time." However, Debruyne warns: "my experience with wireless information transfer in any application is that it still generates lots of errors."

The system is being tested in two settings: a residential site with 214 apartments spread over six buildings near San Sebastian and an office building in Warsaw. The problem with the San Sebastian complex is that it had a centralised [heat production](#) for indoor heating and hot sanitary water. "The heat was distributed by vertically connected radiators that [could] not be shut down without influencing the neighbours' temperature. The apartments were thus controlled by opening the windows at the lower floors. Van der Veken explains how his solution helps remedy this issue: "with the data collected by sensors, we can improve comfort for the upper apartments by reversing the heat flow when necessary and cutting off the heating for the apartments which receive abundant solar energy."

This solution, however, is mainly aimed at collective accommodation or large buildings. "Because of the investment costs, the system is not

suited for individual houses. But in collective dwellings it's possible to monitor several parameters and to control the HVAC-installations in real-time," explains Van der Veken. This real time approach presents energy efficiency benefits. "A sharp real-time monitoring can immediately stop the boiler when the comfort temperature is reached, so no [energy](#) will be wasted," comments Debruyne, "when temperatures go down, the boiler immediately gets reactivated, so no comfort is lost."

Others believe industrial setting would be the candidate to adopt this solution. "I think there can be a market for this system," explains Edwin Segers, CEO at the specialised engineering consultancy Botec, Wommelgem, Belgium "Not for new buildings, that mostly are conceived to go along twenty to thirty years, but in renovation projects" he tells youris.com, "especially in constructions for process technology, such as in pharmacy. That kind of constructions must be very flexible, as production lines can be changed drastically after five years or less."

For now, the simulation is still too time consuming to be commercially interesting, according to Van der Veken. But he anticipates that "future control systems in buildings may be self-taught." To develop such a system for general use, it needs to be customisable. Hence, the importance of the work on self-learning simulation models.

More information: www.tibucon.be/

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