



The WFG technology being tested on prototype buildings in Taiwan | Photo source [Loughborough University](#)

[Innovation](#) > [Property & Construction](#) > [Water-filled windows improve acoustics and reduce energy usage](#)

WATER-FILLED WINDOWS IMPROVE ACOUSTICS AND REDUCE ENERGY USAGE

 PROPERTY & CONSTRUCTION

The new window design and heating and cooling system contribute to a significant improvement in sustainable construction

Spotted: After ten years of global research, Dr Matyas Gutai's water-filled glass heating and cooling system has proved successful in four out of five of the world's climates. The system consists of a small pump and pipe-connecting water-filled glass windows with a storage tank. When exposed to sunlight, the water trapped between the panes of glass absorbs heat, keeping rooms cool in warm seasons. When the glass reaches a particular temperature, the pump replaces the hot water with cooler water.

The tank stores heat, and in cold weather, the piping process happens in reverse, heating the building via the pipes and windows. By replacing traditional windows with the water-filled glass versions, no further aesthetic elements such as tinted glass or shutters are needed.

Two prototype homes use the windows, with the first Water House located in Kecskemet, Hungary, and Water House 2.0 located on the grounds of Feng Chia University in Taichung, Taiwan. Tested in tropical, dry, temperate, continental and polar climates, in cities including Singapore, Tehran and Sao Paulo, the windows saved 34 to 72 per cent of energy used in all climates, except for the polar.

Dr Gutai is part of the UK's Loughborough University School of Architecture, Building and Civil Engineering and continues to develop the technology, as well as explore its commercial availability. Combined with other industrial design innovations Springwise has spotted, such as [ultra-white paint](#) and an [energy-positive hotel](#), there are many positive signs regarding the future sustainability of homes and cities.

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Takeaway:

The new window design and heating and cooling system contribute to a significant improvement in sustainable construction, with windows actively adding value to a building, rather than acting as a drain on resources. Dr Gutai points to the benefits of approaching construction holistically and finding ways to make the best use of each element. Other industries that build products from significant numbers of disparate parts may find such an interconnected approach to design useful, particularly as new materials and manufacturing processes emerge.