

Connecting weather predictions to building management

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University of Adelaide engineering research is promising significant reductions in the energy use of commercial buildings by modelling and predicting temperature changes within a building.

Using public weather forecast information and data from existing building management systems, the researchers have developed an intelligent model that keeps one step ahead of the building's [temperature changes](#), automatically adjusting the heating and cooling supply accordingly.

Experimental results to date have shown at least 10% energy savings are possible.

"Any building environment is subject to changes in the outside world," says Hao Huang, PhD candidate in the School of Mechanical Engineering. "In air-conditioned [commercial buildings](#), the heating, cooling and ventilation systems respond to [temperature](#) changes within the building, passively.

"Our model can be used as a pre-emptive measure to keep ahead of those temperature changes, making adjustments in the heating and cooling supply to keep the building at a comfortable temperature without wasting energy in temperature overshoots."

Mr Huang and supervisor Dr Lei Chen, Senior Lecturer in the School of Mechanical Engineering are part of the University's Centre for Energy

Technology (CET). They are working with Adelaide Airport Limited (AAL) to obtain experimental data as part of a three-year clean energy partnership between AAL and CET.

"We've established how to predict temperature changes and make corresponding control decisions within a [building](#)," says Dr Chen. "Our next step is to integrate the algorithm that Hao has developed into existing commercially available air conditioning control systems," says Dr Chen.

"We expect to be able to make significant improvements in the energy efficiency performance of buildings.

"The potential is enormous— for both individual organisations in terms of cost reductions through savings in energy use, and at a global level.

"If this system is adapted in buildings in cities around the world, the decreased [energy](#) use could make a large difference to the total production of greenhouse gases."

Provided by University of Adelaide

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