CSIRO Builds Smart Energy System

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Researchers at the Energy Transformed National Research Flagship aim to solve problems associated with demand peaks, price volatility and network security.

'Our goal is to democratise the electricity market with user-friendly technology that allows consumers to manage their energy usage according to their preferences and needs,' says Dr Geoff James of the CSIRO ICT Centre.

'For example one consumer may prefer to only run their air-conditioner when energy is below a certain price but to make an exception if the temperature rises to a certain level. Another consumer may wish to switch off energy hungry appliances during demand peaks in return for price reductions.

'Similarly, industrial users can tailor their demand profile to take maximum advantage of fluctuations in price and availability of energy.

'The installation of smart meters in homes and businesses is currently being discussed and this technology allows consumers to get maximum benefit from them.'

The system features intelligent sensors and agents which monitor generation and demand, communicate with each other, and make control decisions based on parameters set by generators, distributors and consumers.

Intelligent software agents capture consumer preferences and interact with smart meters and other agents to act on them.

CSIRO is currently running a prototype energy management system at its Newcastle Energy Centre. Dr Glenn Platt of CSIRO Energy Technology says that the system is effectively a mini electricity grid incorporating a micro-gas turbine generator, photovoltaic arrays, a wind generator, a weather station, cool rooms and part of the building's climate system – all under agent control.

'The sensor and agent technologies coordinate supply and demand, controlling generation and loads intelligently as the market changes,' says Dr Platt.

The system is also being trialled by a major Australian utility company.