New tech offers real-time snapshot of household power flow

Technology that gives insights into the complex interaction between centralised and household electricity generation is being trialled in Australia.

This project is being led by Dr Elizabeth Ratnam and Professor Lachlan Blackhall from the Battery Storage and Grid Integration Program at the Australian National University. The project has deployed new sensors that monitor power flow through electricity grids in real time, and is an important step towards a zero emissions future.

Australia's electricity grids are complex systems. In addition to the existing centralised approach to energy generation and distribution, many Australians now generate and store their own electricity using solar panels and batteries. Managing the operation of the electricity grid through this energy transition is difficult using existing approaches.

This new approach has been funded by a grant through the Global Connections Fund (GCF).

The project foundation emerged from Dr Ratnam's work with two American companies, PingThings and Power Standard Labs. The result combines small grid monitors, known as distribution-level phasor measurement units (or micro-PMUs), with a specialised data management platform called PredictiveGrid.

The micro-PMUs record and stream time-stamped data measurements, including voltage, current and the respective phase angles. This means data on what's happening in different grid locations at the same time can be collected and compared.

Using the data captured from these sensors, new techniques are being developed that integrate all the data into a useful read-out, offering a synchronized overview of the entire grid's operation. This means signs of power outages and power instability can be picked up early.

"The Global Connections Bridging Grant allowed us to begin the trial of micro-PMUs in Australia for the first time," explained Dr Ratnam.

"These new capabilities really provide unparalleled insight into what's going on in the electricity grid."

The project has acted as a kickstarter in other ways too, with Ratnam and Blackhall's research teams now moving forwards to other new projects and commercial engagements.

Dr Elizabeth Ratnam

Future Engineering Research Leader. Battery Storage and Grid Integration Program Australian National University

Professor Lachlan Blackhall

Entrepreneurial Fellow and Head of Battery Storage and Grid Integration Program Australian National University

Tech to provide real time monitoring of power flow through Australia's electricity grids, at macro down to to household levels, is being tested, led by @ANUEnergyChange's Elizabeth Ratnam & @ lblackhall, in conjunction with @pingthingsIO and Power Standard Labs.

The research was funded by a grant from the @ IndustryGovAu Global Connections Fund. @ATSE_au @ausgov

atse.org.au

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