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Tuesday 12 February 2019

Researchers to develop technology for better electricity grid balancing

The potential for home battery systems to balance the supply of electricity, replacing the reliance on large generators, will form part of a new research project, valued at \$1.8 million.

Australian researchers will work with industry and international partners to develop the functionality of devices, such as home battery systems, to mimic the role large generators play in helping to balance the supply of electricity.

Currently, large generators including coal-fired power plants and hydro generators work to sustain the balance in supplying electricity.

However, the steady rise of households and businesses investing in renewable energy options (including distributed solar power systems and home batteries) is leading to increased use of distributed generation and less reliance on centralised larger generators.

Project lead, and University of Tasmania School of Engineering researcher, Associate Professor Evan Franklin, said Australia's power system is set to become the most decentralised in the world.

"The whole power system is changing as we are getting more power from solar, wind and distributed PV generation on roof tops, which means we rely less on coal-fired power plants and hydro generators to operate and help balance the system," he said.

"In Australia, there are currently about 50,000 batteries in homes, where two or three years ago there were practically none.

"There has been a steady increase in the uptake of PV systems as they become more affordable. Projections are one in five households will have a battery installed in the next 15 or so years.

"As we increase electricity production from small generators we operate fewer conventional large generators. These large generators currently play a critical role in balancing the electricity system on a second-by-second basis, and so we need to find a way to replace, or even improve on, that functionality."

The project team, which includes researchers from the Australian National University, will investigate the potential of distributed PV generators, battery systems and electric vehicles to provide power system stability.

Importantly, the project will develop optimisation software that will enable these resources to be scheduled for automatic system frequency support while ensuring that limitations of the distribution network are always respected and that primary use of the resources for owner benefit is maintained.

The project is a collaboration with industry partners TasNetworks and Powerlink Queensland and with Technical University (Berlin). It is also supported by the Department of Foreign Affairs and Trade through the Energy Transition Hub.

"We see a future where Australia's growing fleet of distributed energy resources will play a major role in helping the system remain in balance," Mr Andrew Fraser, Network Innovation Team Leader at TasNetworks, said.

"That won't happen without intelligent coordination to ensure that they operate within physical electricity network limits at all times," said

The research project is being funded in partnership with industry and the Australian Renewable Energy Agency (ARENA).

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