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UQ hoping for their time in the sun

World-leading research into the application of large-scale electricity storage will soon begin at The University of Queensland's St Lucia campus.

THE UQ ST LUCIA ARRAY is almost 25 percent larger than Australia's next biggest flat-panel photovoltaic solar power system – the one megawatt installation at the Adelaide Showgrounds – which was built in 2010, it is more than double the size of the 500kW system that the Sydney Theatre Company installed on its rooftops last year, under the leadership of director Cate Blanchett.

UQ's \$7.75 million solar generating system will provide between five and six percent of the St Lucia campus's peak electricity demand, the system will also connect the University's planned new 1.2 megawatt solar photovoltaic system to a prototype zinc-bromine battery-based energy storage system.

Professor Paul Meredith, Renewable Energy Focal Group Chair at UQ's Global Change Institute and leader of the 1.2MW project, said technology for capturing solar energy had improved significantly in the past decade, but storing that power cleanly and effectively for later use remained one of the industry's biggest challenges.

"In the early days of solar power, lead acid batteries were used, but these are environmentally damaging, have a relatively short life span and are inefficient," Professor Meredith said.



"Zinc-bromine batteries are next-generation technology. They are making solar energy much more useable and effective."

Professor Meredith said the research also highlighted one of the big areas of discovery that the solar array was making possible – how one megawatt-plus size alternative energy sources would interact with the power grid.

"Currently the grid has been set up to take massive, high-voltage electricity inputs from enormous coal or gas power stations," Professor Meredith said. "With the research we will undertake at UQ – in conjunction with our research partners RedFlow, Energex, Ingenero and others – we expect to lay the groundwork for numerous types of renewable energy sources to input power to the grid.

Since two UQ alumni founded RedFlow in Brisbane in 2005, the company has



become known as a world leader in high-performance zinc-bromine flow batteries for grid-connected electricity storage. The prototype RedFlow 200 system, rated at 200 kW, will be linked to a 390 kW section of the UQ PV array, and the performance of those panels will be compared with an identical section with no storage.

"This will demonstrate how large-scale energy storage can be used to manage the harmonics and transient effects of periodic dips in power input, such as those that occur when clouds move across the sky," Mr Hutchings said.

Electricity distributor and retailer Energex has joined UQ as a partner in this research project, and contributed for state-of-the-art equipment to allow high-quality monitoring and analysis of the power feed from the St Lucia solar array.

The UQ Solar Array underpins a number of cutting-edge research projects, in diverse fields including physics, engineering, economics and sustainability, one such project involves addressing one of the most common criticisms of solar power: that it cannot replace 24/7 baseload grid power because it can only be generated when the sun is shining.

Developing effective, safe and cost-effective techniques for storing that power for use when needed would be a vital boost for the continued growth of the solar industry, and for securing its place as a reliable baseload power supplier. □

More information on the UQ Solar Array can be found on the UQ website: www.uq.edu.au/solarenergy