

Hybrid cell solution brings solar efficiency to record high

Australian solar researchers have converted more than 40 per cent of the sunlight hitting a solar panel into electricity, the highest efficiency ever reported.



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The record efficiency was achieved in outdoor tests in Sydney, before being independently confirmed by the National Renewable Energy Laboratory (NREL) at its outdoor test facility in the US.

‘We used commercial solar cells, but in a new way, so these efficiency improvements are readily accessible to the solar industry,’ said Dr Mark Keevers, the University of NSW researcher who managed the project.

The research team combined two different types of panel: advanced triple junction cells and conventional silicon cells. Light ‘wasted’ by the triple junction cells is then split into different spectra and directed onto the silicon cells.

‘The new results are based on the use of focused sunlight, and are particularly relevant to photovoltaic “power towers” being developed in Australia,’ said Professor Martin Green, Director of the Advanced Centre for Advanced Photovoltaics at UNSW.

Power towers are being developed by Australian company, RayGen Resources, which provided design and technical support for the high efficiency prototype. Another partner in the research was Spectrolab, a US-based company that provided some of the cells used in the project.

The work was funded by the Australian Renewable Energy Agency (ARENA) and supported by the Australia-US Institute for Advanced Photovoltaics (AUSIAPV).

‘We hope to see this home grown innovation take the next steps from prototyping to pilot scale demonstrations. Ultimately, more efficient commercial solar plants will make renewable energy cheaper, increasing its

competitiveness,' said ARENA CEO Ivor Frischknecht.

The 40 per cent efficiency achievement is outlined in a paper expected to be published soon in the journal, *Progress in Photovoltaics* .

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