

Australian Solar Power Researchers Achieve 40% Efficiency Mark

Peter Hannam | [CanberraTimes](#)

Australian solar power researchers have achieved world-beating levels of efficiency, potentially making large solar plants more competitive with other energy sources such as coal.

A team from the Australian Centre for Advanced Photovoltaics (PV) at the University of NSW has achieved 40.4 per cent “conversion efficiency” by using commercially available solar cells combined with a mirror and filters that reduce wasted energy.

“It’s horse and buggy days as far as solar is concerned at the moment.” Martin Green, director of the Australian Centre for Advanced Photovoltaics

Martin Green, the centre’s director, said the independently verified breakthrough eclipsed previous records without resorting to special laboratory PV cells that “you’ve got no chance of buying commercially”. Other top-performing solar panels convert about 36 per cent of the sunlight that falls on them into electricity.

The advance involved two steps. Three solar panels were stacked to capture energy from different wave lengths of sunlight, and then excess light from the stacked panels was directed by a mirror and filters to a fourth PV cell, making use of energy previously discarded.

“This is our first re-emergence into the focused-sunlight area,” said Professor Green, who pioneered 20 per cent-efficiency levels in similar technology in 1989.

The institute was prompted to revisit the technology in part because of Australian companies' efforts to develop large-scale solar towers using arrays of mirrors to focus sunlight on PV cells.

One of those firms, Melbourne-based RayGen, collaborated with UNSW on the project. It is building a plant in China with an solar conversion rate of about 28 per cent across the year.. "We'd take them to the mid-30s" for future projects with the technology jump, Professor Green said..

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