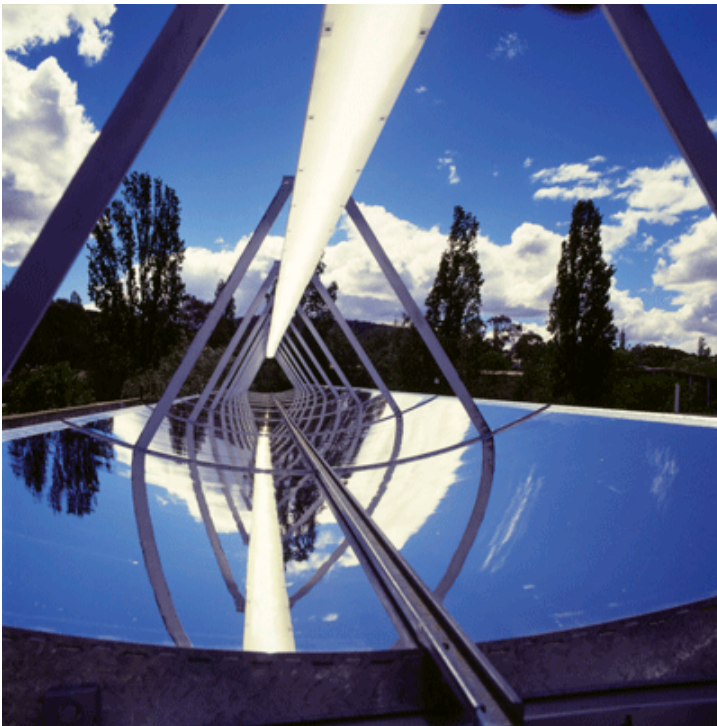


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More energy from the sun: just add cooling fluid

A solar cell innovation that could provide cheaper, more efficient heating and power from linear solar arrays is being developed by researchers at the Australian National University in collaboration with Tianjin University in China.



Credit: ANU

The new technique will result in combined heat-and-power concentrator solar cell receivers that provide a conversion efficiency – converting energy from the sun into usable energy – of 70 per cent.

The innovation is incorporated into a conventional linear-array system, in which mirrors concentrate sunlight onto a long-axis receiver lined with low-cost silicon solar cells, which convert about 20 per cent of the sunlight into electricity. In a conventional array, the process also results in a detrimental rise in temperature.

Researchers are experimenting with immersing the silicon cells directly in cooling fluid, which could enable the balance of absorbed solar energy (80 per cent) to be converted to heat instead of electricity. This heat can be used for hot water supply, or space heating or cooling. The combined electrical and thermal solar conversion efficiency could exceed 70 per cent.

Both universities have facilities and experience in developing linear concentrator systems, including the ANU's expertise in mono-crystalline silicon solar cells, the most well-known example being 'sliver' cells under commercialisation by Origin Energy.

The ANU's Business Development Manager for Solar Technologies, Dr Igor Skryabin, says the university is receiving daily inquiries from prospective Australian and overseas customers about combined heat-and-power solar receivers.

