



## Rural

### World-first 'solar-glass' developed in Perth hopes to 'make deserts bloom'

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**Western Australian scientists have developed what is believed to be a world-first clear, energy harvesting glass which, if used in greenhouses, could produce crops in any climate or season.**

The glass is embedded with nanoparticles which work to draw out 90 per cent of the ultraviolet (UV) and infrared rays from the sun, and transfer those rays to solar cells embedded on the edge of the glass panels.

The rays are converted into energy, while allowing 70 per cent of visible light to pass through.

The energy harvested is used to power the structure, for example providing lighting, heating, cooling, or water desalination and irrigation.

The technology has been developed at Edith Cowan University's Electron Science Research Institute (ESRI) in Perth.

Director of the institute, Professor Kamal Alameh, said being able to convert unwanted radiation into electricity could be a huge cost-saver in greenhouses.

"In a closed environment you don't need a lot of water, so you don't need a lot of energy to filter the water if you have underground water.

"You also don't need a lot of cooling and heating because we use these thin-film coatings to actually block the unwanted radiation so that we can save on the energy used for cooling and heating.

"We hope to end up with a self-sustainable greenhouse, that doesn't need the power from the grid, and then it can be producing its own energy to produce the produce the maximum or a good crop yield."

Professor Kamal said due to its designed self-sufficiency, there are no limitations to where such a greenhouse could be built, which could see agricultural production in areas currently too hot or dry to produce crops.

"If you have underground water that's all we need to basically produce a crop," he said.

The technology has been developed in collaboration with ClearVue technologies.

Chairman of the company, Victor Rosenberg, said the glass would provide farmers "safety and security of product", and reduce the need for chemicals.

"With a closed environment under good controlled conditions, we want to get to the point where we can actually reduce the use of pesticides, fungicides and any other of the chemicals that are used because at the end of the day you do swallow them and you do eat them," he said.

"Safety and security to me is prime."



**PHOTO:** The energy harvesting solar-glass has been trialled as a self-sustainable bus shelter in Melbourne. (Supplied: Victor Rosenberg)

**MAP:** Perth 6000



There are currently similar products on the market and still in development, however according to Professor Kamal, the solar-glass developed at ESRI was the only energy harvesting glass that was also clear.

**PHOTO:** Professor Kamal Alameh has been working with ClearVue Technologies' chairman Victor Rosenberg to create the product, which has been five years in the making. (ABC Rural: Michelle Stanley)

"There are other technologies that embed solar cells into the glass, so they are not fully transparent, or you could say they are partially opaque," he said.

Professor Kamal said the solar-glass produced roughly 35 watts of energy per square metre of glass, which he believed was sufficient due to the amount of visible light which the plants would receive.

ESRI have received a \$1.6 million grant from the Federal Government's Cooperative Research Centre, which will fund a 300 square metre trial greenhouse to be built in the Perth area.

**Topics:** research, agricultural-crops, crop-harvesting, vegetables, solar-energy, perth-6000, melbourne-3000