

Keeping cool using the summer heat

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Internal heating element from CSIRO designed Climate Testing Rig. Image: CSIRO

(PhysOrg.com) -- While most Australians are taking care to shield themselves from the harsh summer heat, scientists from the CSIRO Energy Transformed Flagship are working on ways to harness the sun's warmth to cool our homes and offices.

The leader of the Flagship's solar cooling research project, Dr Stephen White, says significant greenhouse gas savings can be achieved in air conditioning by using energy from the sun.

"Solar cooling utilises heat from solar thermal collectors to generate cooling for building air-conditioning," he says.

"Most conventional mechanical air conditioners use high-emission electricity derived from fossil fuels to provide the energy to compress a

refrigerant and cool a building. This typically accounts for 20-30 per cent of building energy consumption and greenhouse gas emissions.”

Solar cooling consumes less electricity when compared to a conventional mechanical air conditioner and lower electricity consumption results in lower greenhouse gas emissions.

“The solar cooling technology we are developing directly uses the natural heat from the sun to power a thermally-driven cooling process,” he says.

“While using heat to cool sounds like a strange concept, the technology we are developing is able use that heat in conjunction with an absorbent material - or desiccant - to dehumidify and cool air. This new type of desiccant cooling promises to be simpler and more cost effective than absorption chillers.”

Sunshine is perhaps the nation’s most abundant renewable resource with Australia experiencing the highest incidence of solar radiation in the world. Coincidentally, on those days when the sun is shining the brightest, demand for air conditioning is at its highest.

“In this way, solar cooling has the potential to reduce peak demand on the electricity grid by reducing the amount of electricity that is required to meet those air conditioning demands on the hottest days of the Australian summer,” Dr White says.

“Solar cooling technology is uniquely suited to our climate and as the technology develops, it is likely to make an important contribution to the development of future zero-emissions buildings.”

Provided by CSIRO

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