

Researchers develop new possibilities for solar power

Queen's University researchers contribute to breakthrough in solar technology

Two Queen's researchers have contributed to a significant breakthrough in solar technology. Their research has led to a new solar photovoltaic thermal (PVT) system that generates both electricity and heat.

Solar PVTs are normally made with crystal silicon cells which generate electricity, but little heat. Stephen Harrison and Joshua Pearce (Mechanical and Materials Engineering) designed and tested amorphous silicon cells in a PVT system. Their research shows increased heat generation because of higher operating temperatures and 10 per cent more solar electric output.

"These studies open up an entirely new application of amorphous silicon and make a highly-economic PVT possible," says Dr. Pearce. "We need both solar electricity and solar heating in Canada but we are running into 'roof real estate' issues. Now people can have both their solar electricity and solar heating combined in a nice tidy package."

The amorphous silicon has several advantages over crystal silicon. It requires less material, costs less to manufacture and offers a higher return on investment. The research also shows amorphous silicon solar cells can be made into thicker cells as long as they are operated at higher temperatures in the PVT system.

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The research was published in *Solar Energy Materials and Solar Cells* and *Solar Energy*.

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