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HEAT PUMPS GIVE SOLAR HOT WATER A BOOST

Michael R. Collins

Some things go better together: peanut butter and jam, patios and beer, movies and popcorn. According to University of Waterloo mechanical and mechatronics engineering professor Michael Collins, you can add solar hot water systems and heat pumps to that list.

More and more rooftops across Canada are sporting solar thermal collectors that use heat from the sun to warm the water destined for showers, dishwashers, washing machines and even radiators. Because they use significantly less energy than their electric counterparts, these domestic solar water-heating systems are great for the environment and for your bank balance.

Want to slash your energy use even further? Add a heat pump to the mix, says Collins. These devices work like an A/C unit in reverse, transferring heat from a cold space to a warmer one.

By incorporating a heat pump and a second tank to a standard solar water-heating set-up, Collins has created a highly flexible system that adapts to changing household demands and weather conditions. If the sun isn't shining strongly, for example, the heat pump kicks in. Running a bath in the evening? The system can draw on hot water from the additional storage tank. A custom-built controller decides which of 12 configurations is the most energy-efficient option at any given moment.

A normal 7.5-square-metre solar water-heating system uses 40 per cent of the electricity needed to run an electric water-heater. Collin's dual-tank system reduces that to just 31 per cent, offering businesses and homeowners significant electricity and cost savings.

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