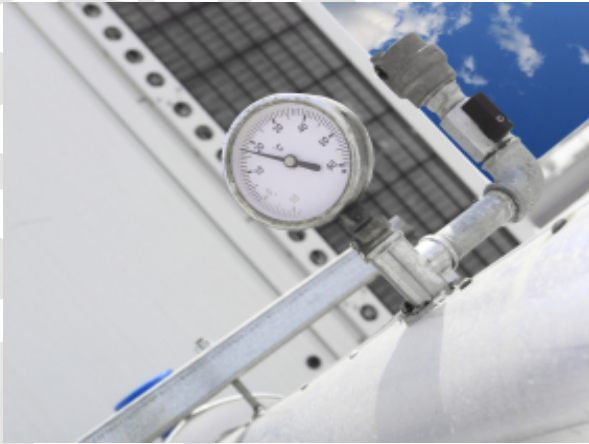




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COLD CLIMATE HEAT PUMPS: MEETING THE CHALLENGE OF CANADIAN WINTERS

Michael Collins, John Straube

Waterloo researchers Michael Collins and John Straube are changing the face of home heating and cooling in Canada, thanks to new, inexpensive heat pump technology.

Heat pumps operate on the same basic principle as a refrigerator. They move thermal energy from one area to another by using a refrigerant that absorbs heat as it vaporises and release it when it condenses. This allows you to extract energy from outside air - even when that air is quite cold - to warm a house in winter, or reverse the process in the summer.

Unfortunately, the process loses efficiency when outdoor temperatures plummet. Until now, that's meant relying on backup heating in the depths of winter or significantly over-sizing the heat pump to ensure your house stays warm on extra-chilly days.

Collins and Straube took a different approach, using a variable-capacity compressor that can be modulated very precisely to maximize efficiency. The resulting Cold Climate Heat Pump (CCHP) can handle the heating demands of winter temperatures as low as -20 degrees Celsius without the need for a back-up heat source.

Now the researchers are working with Ecologix, a Cambridge, ON manufacturer, to test these heat pumps in real-world conditions. If their market trials are successful, the CCHP could dethrone fossil fuels as the standard source of home heating in Canada and, in the process, cut national greenhouse gas emissions.

Partners: Ecologix Heating Technologies, Emerson Climate Technologies, Region of Peel, Strack and Associates, D.J. Young, Thermatlantic, Chatham-Kent Hydro, Natural Resources Canada