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Desiccant Evaporative Cooling for Residential Buildings

Objective

To investigate desiccant-based air-conditioning as a means to improve the energy efficiency of houses.

Background

Desiccant-based evaporative cooling is an alternative to conventional vapour compression air conditioning systems that reduces air conditioning requirements by removing humidity from ventilation air. It is driven largely by thermal energy, uses no ozone layer depleting refrigerant, reduces energy consumption and peak electricity demand, and improves indoor air quality by providing a drier and more comfortable indoor environment. Most applications to date have been in large buildings with central HVAC systems, and there is little data about their effectiveness in houses.

Statement of Work

- Design and build a desiccant-based evaporative cooling system suitable for houses.
- Install the system in the test house at the Canadian Centre for Housing Technology (CCHT) test house in Ottawa, and a conventional vapour compression cooling system in the CCHT reference house.
- Collect comparative data on the performance of the two systems during the summer of 2007. This task may be extended to other seasons.
- Using the TRNSYS energy simulation program, create models of the dessicant-based and conventional systems as they would be installed in a typical R-2000 house.
- Use the models to compare the energy performance of the proposed system to the conventional system in various Canadian climate zones.

Expected Outcomes

A report to the partners that will draw conclusions from the analysis of performance testing of the desiccant evaporative cooling system, and make recommendations.

Partners

Natural Resources Canada and Venmar Ventilation Inc. Other partners are being sought.

Twin Research Houses at the Canadian Centre for Housing Technology

Start/Expected Completion Dates

This project began in September 2006 and will be in completed in March 2008.

Project Manager

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For more information, please see http://irc.nrc-cnrc.gc.ca/ie/iaq/desiccant_e.html

Factsheet 77, December 2006