



**NRC-CNRC**

Institute for  
Research in  
Construction

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## **Efficient Air Movement and Heat Delivery**

### **Objectives**

To investigate ways of improving the energy efficiency of fans in forced-air heating systems. To evaluate the energy efficiency of alternative heating systems.

### **Background**

Radiant floor heating proponents claim fuel savings of 15-20% over forced-air systems. A hydronic system can transport a given amount of heating energy using less than 5% of the energy used by a conventional motor and fan in a forced-air system. Combined with more efficient forced-air systems, a hydronic system may improve comfort and save energy.

### **Statement of Work**

- Develop a furnace fan with improved aerodynamic efficiency and couple it with a suitably sized electronically commutated motor (ECM). This will include seeking to ensure that any such improvements can be scaled down to the range of airflow rates appropriate for other residential ventilation devices such as range hoods, bathroom exhaust fans and heat recovery ventilators.
- Determine the relative energy efficiency of hydronic radiant floor heating systems compared to forced-air heating systems, and any promising hybrid combinations thereof. This will include a review of information available on radiant floor heating and hybrid heating systems combining radiant and forced-air heating to 1) validate the claims of improved energy efficiency and occupant comfort for radiant heating systems, and to 2) identify promising alternatives to forced-air systems.
- Evaluate prototype alternatives in realistic Ottawa weather conditions, using IRC's two-storey test house, to determine their possible energy benefits.

### **Expected Outcomes**

Report summarizing energy benefits of better fans and alternative heating systems.

### **Partners**

Panel on Energy Research and Development, Natural Resources Canada, EBM Industries Inc., Enbridge Gas Distribution

### **Start/Completion Dates**

The project began in 2004 and is expected to be completed in 2008.

### **Project Managers**

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For more information, see [http://irc.nrc-cnrc.gc.ca/ie/iaq/factsheet12\\_e.html](http://irc.nrc-cnrc.gc.ca/ie/iaq/factsheet12_e.html)

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