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CCHT testing combo heating systems

By Will Koroluk

Driven by a commitment to reduce levels of carbon dioxide emissions as a part of the Kyoto Protocol, Canadian manufacturers and researchers are seeking ways to do just that.

It's no surprise, therefore, that early projects being undertaken at the new Canadian Centre for Housing Technology (CCHT), involve innovative systems for home heating.

These "combo" systems roll space heating and water heating together into a single system. They provide domestic hot water, but also contain a fan coil so that heat extracted from the water can be used to heat the house. Thus one burner is used, instead of separate burners for water heater and furnace.

Luc Saint-Martin, CCHT's business manager, says the test systems are being installed now, and should be ready in time for experimentation to begin somewhere around Jan. 1. It will take 12 weeks to run the project, which involves two different water heaters from two different manufacturers.

Saint-Martin says the experiment will schedule the water draws in the house according to the ASTM standard for water heaters, which provides for specific amounts of hot water to be drawn at specific times of day—large amounts needed for morning showers, for example, or for running a dishwasher in the evening.

"Doing that will provide for a realistic simulation, so we'll be able to see what effect those draws on the hot-water supply have on heating the house," he says.

The project dovetails nicely with the interests of the Advanced Integrated Mechanical Systems (AIMS) project being run by Natural Resources Canada (NRCan), which is one of the partners in CCHT.

NRCan is providing some of the funding for the combo project at CCHT, along with Union Gas and Enbridge Consumers Gas.

Along with NRCan, the partners in CCHT are the National Research Council (NRC) and Canada Mortgage and Housing Corporation (CMHC). NRC, through the Institute for Research in Construction is the centre's operating agent and Saint-Martin's employer.

Built at a cost of \$1.6 million, CCHT is made up of two identical detached homes and a three-unit townhouse, all built to R-2000 standards.

The twin houses simulate occupancy of a typical Canadian family, and, through sophisticated monitoring, can measure even the most subtle changes in the indoor environment.

They are identical in every respect because one must serve as a "reference house" to serve as an experimental control. The house beside it is where the experiments are done. Thus, a combo system can be installed in the test house and its performance and impact measured against the reference house.

The townhouses provide display space, and office and meeting facilities.

Saint-Martin says there are already more projects lined up to follow the work on combo systems.

“One involves a radiant paint developed by a large company with international operations,” he says. “The manufacturer wants to assess how well the paint performs its function of reflecting heat back into the house, enabling occupants to be comfortable at lower thermostat settings.”

“The other is a system of light-actuated window blinds that close automatically and reduce heat gain from the sun. This, of course, would result in energy savings as air conditioners would not have to work as hard.”

As part of the Kyoto agreement, Canada—along with many other nations—agreed to stringent reductions its emissions of greenhouse gases, which explains the interest of manufacturers and researchers.

Industry reaction to the CCHT start-up has been gratifying, Saint-Martin says.

“There are a lot of new materials and new ideas out there, and we’re being approached by people who want to test them. We have to find ways to accommodate them because they want to come in now.”

That interest, though, serves to demonstrate the need for enlarged research facilities.

“We’re limited because we can’t run projects that would interfere with each other. While we’re running the experiment on combo systems, for example, we can’t be running another one that might affect the energy balance of the house.

“The answer, somewhere down the road, might be more research houses—either beside the present houses on the NRC’s Ottawa campus, or somewhere else in the country. Perhaps, too, they could be differently built.”

There is interest in the steel and concrete industries, he said, so it might be possible to have a house built with insulated concrete forms, for example, and of the same size, with the same features and the same orientation as the wood-frame houses.”

“That would enable them to run head-to-head with the wood-frame houses so the performance could be compared.”

The big stumbling block, of course, is money.

“We know someone who is prepared to come in and build a radiant floor and someone else who is prepared to do insulated concrete walls. But that’s not a house; that’s maybe 25 per cent of a house. Where do we get the other 75 per cent?”

Saint-Martin emphasized that any suggestion of expansion is just speculation, because the subject hasn’t even been talked about with the CCHT partners.

“For now, we’ve got plenty to do, including lining up more research projects.”

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