



SUSTAINABLE BUILDINGS AND COMMUNITIES GROUP THE ēKOCOMFORT® EXPERIENCE



CLEAN ENERGY TECHNOLOGIES

ADVANCED INTEGRATED MECHANICAL SYSTEMS

The trend for Canadian home builders to produce tighter, better built envelopes is improving home comfort, reducing space heating demands and increasing the need for mechanical ventilation. The housing market is also experiencing an increase in demands for high performance water heating, combined forced air and radiant heating, and continuous controlled and efficient ventilation.

The CANMET Energy Technology Centre (CETC) recognized the opportunity offered by these market conditions to further improve energy efficiency in homes and carried out research to demonstrate that mechanical systems which integrated space heating, water heating and ventilation functions had significant potential in today's housing market. This led to the creation of a unique private-public sector initiative and the creation of a new class of product known as the ēKOCOMFORT® system.

THE ēKOCOMFORT SYSTEM

ēKOCOMFORT products meet a home's requirements for space heating, hot water and continuous ventilation – all from a single system. At the heart of these systems are advanced heat generators that heat water, typically using modulating or multi-firing rate burner technology. The heat generators provide space heating via air handlers that typically use high efficiency fan motors. Water heating is provided via a heat exchanger with or without a storage tank. And ventilation requirements are met by a heat recovery ventilator (HRV) integrated with the air handler.

ēKOCOMFORT performance is defined by the overall thermal and electrical efficiency specifications for providing space heating, water heating and ventilation needs using gas fired equipment. There is flexibility in the choice of technologies used by manufacturers to meet each type of demand on the system.

The approach to rating the performance of these systems recognizes that most common HRV installations use the furnace blower to circulate fresh air and that the electricity used for both systems needs to be accounted for. As a result, most ēKOCOMFORT manufacturers use high-efficiency electronically commutated motors (ECM) that consume a fraction of the electricity used by conventional motors to operate at the low continuous speed needed to circulate ventilation air.

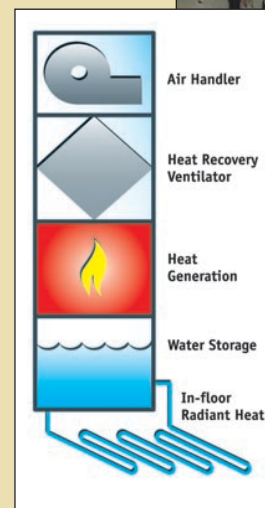
Radiant in-floor heating for basements and tiled areas is an easy option for these water-based heating systems. And cost effective forced air can be used for heating and optional cooling of the whole house.

THE FUTURE OF HOME COMFORT

Bringing together mechanical functions, the ēKOCOMFORT integrated home comfort

system combines space heating, hot water, ventilation, and air circulation in a single, space-saving unit.

The benefits are improved air quality, reduced energy consumption, increased system performance, and integration of controls.



CETC FACILITATES INNOVATION

As the energy research and development branch of Natural Resources Canada, CETC led a consortium of manufacturers, trade associations, utilities and government agencies to create what would become the ēKOCOMFORT system. Not only was this group to engage in innovative technology development, but together they would address market infrastructure issues that hampered the commercialization of advanced integrated mechanical systems.

To begin, the consortium agreed upon performance specifications and design guidelines to identify common requirements for the systems that were to be built by the manufacturers.

Three laboratory programs played significant roles in the ēKOCOMFORT success. Manufacturing groups individually contracted CETC's Integrated Energy Systems lab to access valuable expertise for testing, assessing and troubleshooting their equipment. The Canadian Centre for Housing Technology was used to provide intensive first field trial monitoring results so adjustments could be made prior to installation in occupied homes. And Bodycote Materials Testing Canada, selected through competition, worked with manufacturers to test products against a new protocol that laid the groundwork for the Canadian Standards Association's P.10 standard for integrated mechanicals.

Consortium members also collaborated to create awareness of the systems in the marketplace. The ēKOCOMFORT trademark was registered by CETC, licensed to the participating manufacturers, and promoted to build brand awareness. Shared promotional pieces such as a web site, video, and brochures were produced. And in 2002, the consortium unveiled four prototypes to the HVAC industry at the Canadian Mechanical Exposition in Toronto, which in turn led to early field trial partnerships for some of the manufacturers.

The following key partnerships were also created as a result of the ēKOCOMFORT initiative:

- Technology Early Action Measures and the Industrial Research Assistance Program became important federal funding sources;
- The Heating, Refrigeration and Air Conditioning Institute of Canada supported the working groups with product development, defining lab test and field assessment requirements, and broadening market education;
- The Canada Mortgage and Housing Corporation carried out the field trials; and
- Enbridge Gas Distribution and Union Gas chaired working groups and co-funded lab testing.

BENEFITS & OUTCOMES

The private-public partnership created through CETC's ēKOCOMFORT program allowed participating manufacturers to access the capital, resources and expertise necessary to innovate technology and accelerate their competitive advantage.

They were exposed to innovative technology and processes, and benefited from new market channel partners, technical expertise, and third party lab testing and field trials. Together they leveraged their resources to achieve market awareness for their products and acquire federal funding for the development of efficient, high performance products.

Other key outcomes include:

- An ēKOCOMFORT council of eight manufacturing members established at the Heating Refrigeration and Air Conditioning Institute of Canada (HRAI);
- Manufacturers have been able to utilize third party lab test and field trial monitoring results to commercialize next generation integrated products;
- Derivative products have been developed such as higher performance boilers and integrated air handlers with heat recovery ventilation; and
- The Canadian Standards Association is nearing completion on a new standard – CSA P.10 “Testing Method for Performance of Residential Integrated Mechanical Systems”. Rating to this standard will enable builders and consumers to compare product performance.

To find out more about the ēKOCOMFORT® program, the HRAI ēKOCOMFORT Council manufacturers and their integrated products, please visit www.ekocomfort.ca.



To find out how you can benefit from working with CETC, contact Natural Resources Canada at 613-995-0947 or visit www.sbc.nrcan.gc.ca