



State-of-the-art research centre to advance sustainable building practices

Greater Vancouver Regional District,
British Columbia

Green Municipal Fund Case Study



An artist's rendering illustrates the proposed Centre for Interactive Research on Sustainability (Photo: Busby Perkins + Will, used with permission from the Centre for Interactive Research on Sustainability, University of British Columbia).

Centre for Interactive Research on Sustainability (GMEF 5192)

Date project completed: January 2006

Total project value: \$200,000

GMF grant: \$100,000

- Zero-emission building planned
- Sustainable building technologies and products researched
- Innovative, energy-saving design elements recommended
- Building procedures and tools for developers produced

PROJECT TEAM

Sustainable Development Research Institute,
University of British Columbia
Greater Vancouver Regional District
Interdisciplinary steering committee
Stantec Consulting Ltd.
Busby Perkins + Will
Ambit Consulting
Keen Engineering
Helyar and Associates

OVERVIEW Working in partnership with the GVRD, the University of British Columbia's (UBC) Institute for Environment, Resources and Sustainability (IRES) conducted a feasibility study to construct the most environmentally advanced building in Canada. Using many renewable energy systems, the building will eventually produce more energy than it consumes, making it one of Canada's first zero-emission buildings. The new building will house a state-of-the-art research facility that will test, monitor and evaluate many different sustainable building products and practices.

CONTEXT The IRES and the GVRD wanted to create a building that would demonstrate leading-edge research on sustainable design practices, products and systems. The building would contain an internationally recognized research centre that would accelerate the adoption of sustainable building technologies and urban development practices. Through its research, the Centre for Interactive Research on Sustainability (CIRS) will narrow the gap between the technological feasibility of sustainable building practices and their implementation, and encourage change to standard building practices.



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The proposed location for the CIRS is at the Great Northern Way Campus of the University of British Columbia, which is located in the False Creek Flats area of Vancouver.

APPROACH A 20-member CIRS steering committee was formed, including municipal, provincial and federal officials, and representatives from academic institutions. The steering committee and a team of consultants identified seven focus areas for the design and construction of the CIRS: site design, energy consumption, water use, resource conservation, health and well-being, maintenance and operation, and sustainable community development. Goals, design strategies, building systems and sustainable technologies were identified for each area.

The design team researched current, leading-edge, and emerging sustainable building technologies and products. Meetings held with institutional, industry and community stakeholders supplemented the research. The team developed a series of recommendations on the construction of the building, the selection of materials, and the heating, cooling, electrical and other design elements to be incorporated into the proposed centre to meet its sustainability goals.

RESULTS The study recommended the following features for the CIRS facility:

- Precast concrete construction forms to enable the building to be updated as technology changes.
- “Double-skin” walls that trap heat between the inner and outer layers.
- A green roof to insulate the building and filter stormwater.
- Renewable energy technologies (solar photovoltaics, fuel cells, a cogeneration plant, a micro wind turbine, ground source heat pumps and solar hot water collectors) to supply the building with its own heating, cooling and electricity, and also to generate a surplus of electricity.

- Natural ventilation and a “living wall” of plants to ensure excellent indoor air quality.
- Rainwater collection, on-site wastewater treatment systems, daylighting, energy-efficient lamps and fixtures, and occupancy sensors.

Because the CIRS will aim to change standard building practices, the study team also reviewed how the wider implementation of its design elements would affect the building industry. Compared to current industry standards, adopting sustainable building practices in the residential sector alone could save as much as \$18 billion in energy costs. Changes in consumer behaviour, reduced energy use and superior building practices could reduce building emissions by 86 per cent, representing about 120 million tonnes of carbon dioxide.

LESSONS LEARNED Dr. John Robinson, professor at IRES, said that the main barriers the study team has encountered were not technical or financial obstacles, but institutional factors like building codes and practices, regulations, performance criteria, lack of skilled labour and people’s reluctance to change their behaviour.

“As a result, everything takes longer than anticipated because everything is outside standard operating procedure,” he said. Developing a network of supportive partners proved to be essential. “Sustainability is a group project. It cannot be created by individuals, no matter how senior.”

He added that, in any green building project, people need to understand the amount of time required at the design and planning stage. A crucial attribute of the CIRS project is the development of procedures and tools that could be used by other building developers, such as performance-based equivalencies for building code requirements.

The building’s schematics and initial design were completed by the summer of 2006.



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NEXT STEPS In March 2007, the university began to explore the possibility of including the new World Centre for Digital Media as a tenant in the building. If the proposed arrangement proceeds, the building's size will increase by about 50 per cent and require amendments to the existing design. The team aims to finish the working drawings before construction begins in the spring of 2008.

CONTACTS

Project contact

John Robinson, Professor
Institute for Resources, Environment
and Sustainability
University of British Columbia
Tel.: 604-822-9188
E-mail: johnr@ires.ubc.ca

General contact

Misty Lockhart
Research and Project Coordinator
Centre for Interactive Research on Sustainability
Institute for Resources
Environment and Sustainability,
University of British Columbia
Tel.: 604-822-4644
E-mail: misty@ires.ubc.ca

ADDITIONAL RESOURCES For other GMF projects of this type or category, or from this municipality, province or territory, please contact FCM's Capacity Building program, Energy Campaign, at 613-907-6214 or at energy@fcm.ca. For the complete project report, please visit the FCM Centre for Sustainable Community Development website at www.sustainablecommunities.fcm.ca.

About the Green Municipal Fund

The Government of Canada endowed the Federation of Canadian Municipalities (FCM) with \$550 million to establish the Green Municipal Fund (GMF). The Fund provides low-interest loans and grants, builds capacity, and shares knowledge to support municipal governments and their partners in developing communities that are more environmentally, socially and economically sustainable.