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UW competes to build solar house

Waterloo - A team led by students from the UW school of architecture is among 20 finalists in the Solar Decathlon, a competition sponsored by the United States government "to design, build and operate the most attractive and energy efficient entirely solar powered home". Competitors in the 2009 Decathlon were announced in Washington this week.

"This is the first time that Waterloo has submitted a proposal to the competition," says a news release from student coordinator Lauren Bardhyt and faculty coordinator Geoffrey Thün. "The team's concept for the house (pictured), called North House, is a holistic, responsive and flexible strategy for solar living in the diverse territory and extreme climates of northern regions."

The Solar Decathlon is sponsored by the U.S. Department of Energy and the National Renewable Energy Laboratory, which seeks to foster development and facilitate widespread adoption of solar-powered homes that demonstrate solar technologies in marketable applications. Teams will be judged in 10 areas including architecture, engineering, livability, marketability, comfort, power generation for space heating and cooling, water heating, and powering lights and appliances.

The prototype homes will be installed in a "Solar Village" on the National Mall in Washington, where visitors can tour them to learn about design and construction techniques. After the competition, North House is expected to be on display at the 2010 Winter Olympics in Vancouver. It will then become part of a permanent public display at the Kortright Living City Centre outside Toronto.

The UW project, says the news release, "will engage undergraduate and graduate students working in collaboration with leading faculty members at all three institutions. The project will build upon ongoing innovation in sustainable off-grid housing and responsive envelope technology at the School of Architecture, and in PV Thermal solar and integral blind systems within Mechanical and Mechatronics Engineering."

Students from Ryerson University and Simon Fraser University are also part of the North House bid, and it will benefit from research in Net Zero Design and Energy Modeling and Analysis at Ryerson and "new systems of Integrated Interface that deploy mobile and ubiquitous computing utilizing hand-held technologies" from SFU. The prototype house will employ two key strategies developed by the team: "Holistic Solar" — an approach to making buildings and living within them that incorporates the energy and benefits of the sun in all ways possible — and "Haptic Solar", explained as "Making Sustainable Action Tangible".

The key to Haptic Solar, says the release, is the development of an Adaptive Living Interface "that will make sustainability personal and physical by developing ways that people can measure sustainability with their own bodies. The current intention is to develop the interface through the device of the cellular phone. Occupants will be able to interact with the technologies and systems of the home and to assist them in making informed decisions about energy use by providing feedback on the energy state of the home. Interface devices and ambient cues will communicate the house's performance over time, provide integrated controls to all building systems, and living patterns by modeling occupant routines so that the building can adapt its energy use patterns to its use. The phone could become an interactive container of the energy use of the house that will connect the occupant its systems of the house while both at home and away."

An early challenge for the team is raising more than \$1 million to develop and build the house. Some funding will come from the American government, the three universities have each promised seed funding, and the Canadian Design Research Network is kicking in some funds, the release says.



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