

# FROM ITS SOARING WOOD STAIRCASE TO ITS ENERGY-EFFICIENT LIGHT BULBS: UBC'S NEW EARTH SCIENCES BUILDING PRACTICES WHAT IT TEACHES

The new Earth Sciences Building at the University of British Columbia has many stunning design elements but none more stunning than its five-storey cantilevered solid timber staircase. The first of its kind in the world, the staircase floats up the side of the open-concept atrium that links the building's two wings: the concrete south wing, which houses a range of laboratories, and the wood north wing, where offices and classrooms are located.

## IT'S A COMPLEX BUILDING, DESIGNED FOR A COMPLEX PURPOSE

The Earth Sciences Building (ESB) houses the departments of earth, ocean and atmospheric sciences, mathematics and statistics, as well as the office of the dean of science. The intent is to encourage inter-disciplinary collaboration and creativity among the faculties and help advance solutions to such pressing global issues as climate change and environmental degradation. With that focus, the new building itself had to both actively encourage teamwork – which it does through a variety of formal and informal meeting spaces, including extra-wide landings on the staircase – and also model sustainability and energy efficiency.

"We built ESB to meet LEED Gold standards," says Craig Knight, Development Manager and Financial Analyst for UBC Properties Trust, "and using wood (ESB is the largest panelized wood project in North America) was a deliberate choice for its environmental benefits. The wood materials in the ESB will sequester about 2,600 tons of CO<sub>2</sub>. We also wanted this building to be a model of energy efficiency – not easy, when you consider it has 54 fume hoods that just eat up power."

Fume hoods are vital safety equipment intended to limit exposure to hazardous chemicals or toxic fumes, but one fume hood alone can use more energy than three typical B.C. homes.

## FOUR ENERGY CONSERVATION MEASURES = 1 MILLION KWH OF ENERGY SAVINGS

The BC Hydro energy-modeling study revealed that, for the ESB, just four primary measures could potentially save more than 1 million kilowatt hours of electricity a year:

1. A high-efficiency heating, ventilation and air conditioning system. This system includes variable air volume and radiant heating and cooling systems coupled with displacement and demand-controlled ventilation and heat recovery systems that pre-heat domestic hot water and incoming fresh air.
2. Reduced lighting power density, achieved by allowing daylight to reach into much of the building combined with high-efficiency ambient and task lighting.
3. Lighting controls that ensure lights go on only when necessary.
4. Low-flow domestic hot water fixtures.



## THE NATURE OF SCIENTIFIC RESEARCH: IT TAKES ENERGY

"Scientific research is very energy-intensive by nature," says Knight. "In addition to the fume hoods, there's the heating, ventilation and air conditioning, as well as the lighting, that needs to be on many hours a day."

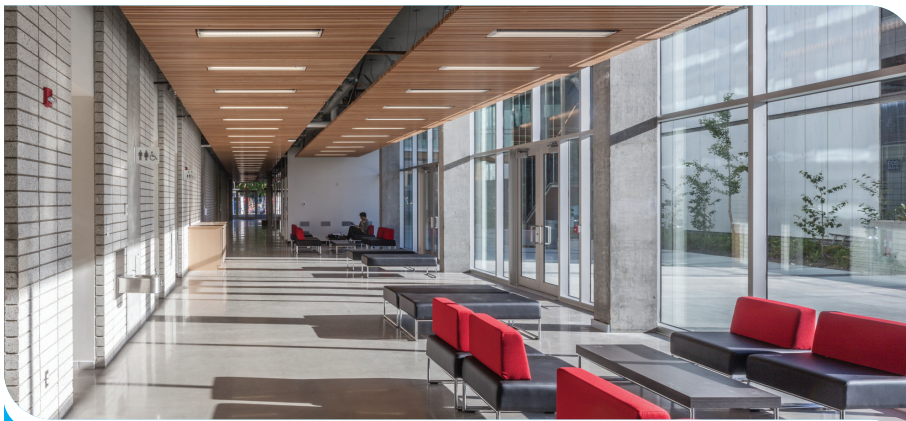
To try to mitigate that energy-intensiveness, UBC made a decision early in the design process to participate in the BC Hydro New Construction Program, which provides funding for an energy-modeling study and financial incentives for installing the energy-conservation measures identified there.

"The energy-modeling study is an important tool for all our design teams now," says Knight. "It's a simulation that allows us to understand how a building we are in the process of designing will perform against a base building constructed more typically, without energy-saving measures."

## IT'S A WIN-WIN

"With BC Hydro's incentives, installing these measures made it essentially cost neutral for us to go as energy efficient as possible with this building," says Knight, who is now finishing his next UBC project, the Djavad Mowafaghian Centre for Brain Health, another multi-disciplinary facility, this time housing patients and researchers of neuroscience, neurology and psychiatry. It, too, has gone through energy modeling with the BC Hydro New Construction Program.

"Our buildings will be more energy efficient for life if we design them right from the beginning," Knight says. "It's a win-win."



## ABOUT THE NEW CONSTRUCTION PROGRAM

The New Construction Program provides financial incentives for new commercial, institutional and multi-unit residential buildings and major retrofits. If you qualify, BC Hydro will fund up to 100 per cent of an energy-modelling study that can be used towards your LEED certification and to apply for FortisBC capital incentives (some restrictions apply).

To find out more, visit [bchydro.com/construction](http://bchydro.com/construction) or call 1 866 522 4713.

## WHAT DOES AN ENERGY-MODELING STUDY DO?

"It helps us see where we stand, how good our building is and how good it could or should be," says Craig Knight, Development Manager and Financial Analyst for UBC Properties Trust. "It also shows us how major changes, like how the building sits on its site and gets more or less sun, and more minor tweaks, like adding lighting controls, can change energy consumption over an entire year."

