



Hot idea keeps buildings warm

ROADMAP TO CARBON NEUTRALITY: TAKING CAMPUS SUSTAINABILITY TO THE NEXT LEVEL

Adding buildings to the University of British Columbia's Okanagan campus while keeping energy use in check has been no easy feat, but years of planning and adjustments are paying off as the campus anticipates one of the most energy-efficient heating and cooling systems in North America.

Roger Bizzotto, director of Facilities Management, says the geo-exchange district energy system (DES) is on the leading edge of reducing natural gas consumption and the campus' carbon footprint. While the campus is not the only facility using DES, district energy and similar clean-tech solutions are emerging at increasingly rapid rates among energy-conscious organizations and within cities.

"Through our DES, thermal energy is simultaneously extracted or injected into a liquid ring within the building where it can then be drawn upon when it is needed," says Bizzotto. "The number of buildings on campus has nearly tripled over the last five years, but we're seeing greater energy efficiencies per square metre."

If one area of a building is too warm, the excess heat is delivered to another area in the building that is too cool. A prime example of an area that generates excess heat is the campus computer network server rooms. Bizzotto says that instead of merely discharging the warm air outside, the air is pumped into the DES and used to help heat other parts of the building. The principle of energy sharing is also carried out in a larger scale from building to building, so the excess heat from one building will be delivered to the other through the campus-wide district energy ring.

"The heat is already available, so why not make the best possible use of it?" says Bizzotto. With the development of the DES, the geo-exchange system is needed even less than originally planned. Only when the building and DES are unable to keep up with the heating and cooling demand does the geo-exchange system kick in. Geo-exchange technology extracts low-grade heat from the earth. Water is taken from a lake-size underground aquifer, and the water is compressed to reach a higher usable temperature that heats buildings in winter. During summer, the focus shifts to cooling the buildings using the relative cold temperature of the aquifer water.

"UBC is striving to be as environmentally responsible as possible. The campus geo-exchange district energy system will



Roger Bizzotto, director of Facilities Management (second from right) and his team, Colin Richardson (right), manager of geothermal, Martin Gibb (left), manager of operations and utilities, and Lorne Antle, UBC Properties Trust, are working together to ensure the geo-exchange system operates at optimum efficiency. All have played key roles in the development and implementation of the geo-exchange district energy system.

help us save energy and reduce carbon emissions," says Jackie Podger, associate vice president, Administration and Finance.

Bizzotto admits it was a complex system to set up but the long-term benefits to the campus and to the environment are well worth the effort. The collective work and creativity on the part of many stakeholders including Lorne Antle, project manager with UBC Properties Trust, has made the system possible.

"We have a very high benchmark set by our President to become carbon neutral," says Bizzotto. By 2015, the University intends to reduce its carbon footprint by 33 per cent compared to 2007 levels. That reduction jumps to 67 per cent by 2020, and 100 per cent by 2050.

Facilities Management and the Okanagan Sustainability Office are working closely together to assess the effects of the geo-exchange DES and to develop an energy management strategy to help achieve these targets. Bizzotto and others believe the geo-exchange DES will play a critical role. ●