shift

SUSTAINABILITY INITIATIVES AT UBC'S OKANAGAN CAMPUS

a place of mind

THE UNIVERSITY OF BRITISH COLUMBIA | OKANAGAN SUSTAINABILITY OFFICE | JUNE 2012 | WWW.UBC.CA/OKANAGAN/SUSTAINABILITY

SHIFTING PERSPECTIVES

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WELCOME to the third edition of SHIFT, an annual sustainability publication produced by the Okanagan Sustainability Office. SHIFT was developed to highlight leadership at all levels of the University of British Columbia's Okanagan campus – leadership that has served to advance UBC's ambitious commitments to sustainability.

Sustainable development is an ongoing process that is furthered by a collective effort on the part of many individuals on and off campus. As a university campus, working collaboratively allows us to develop new ways to integrate sustainability on campus and to extend our reach and impact to the communities we serve.

This edition of SHIFT highlights sustainability leadership that is applied, relevant and diverse. Whether it is campus practices that support increased operational efficiency, programs to contribute to corporate social responsibility, or research undertaken with the community, each initiative, partnership, and project has been undertaken with the care and passion to make a difference.

We believe that recognizing and celebrating the work of others engenders a culture of sustainability within our campus community and inspires creativity and future actions to support our goals. We thank the contributors to this year's SHIFT for your tremendous leadership, and aspire to further strengthen our efforts and resiliency as we move forward together.

SUSTAINABILITY
is a
movement
—a shift—
toward
a more
resilient
future.

MILESTONES

2007 U-PASS
STUDENT UNIVERSAL BUS PASS

2008 $2.9 MILLION
KNOWLEDGE INFRASTRUCTURE FUND TO RETROFIT EXISTING ACADEMIC BUILDINGS FOR GROUNDWATER GEOTHERMAL HEATING

5 GREEN GLOBES
CHARLES E. FIPKE CENTRE FOR INNOVATIVE RESEARCH
1ST BUILDING IN CANADA TO GET THE HIGHEST ACHIEVEMENT FOR ENVIRONMENTAL & ENERGY PERFORMANCE

$127K REBATE
1st WATERFILZ KIOSK ON CAMPUS
FROM FORTIS BC POWERSENSE PARTNERS

2009
FORTIS BC POWERSENSE CONSERVATION AWARD
UNIVERSITY CENTRE FOR AN ESTIMATED ENERGY SAVINGS OF 1,125,000 KILOWATT HOURS PER YEAR

2010 $58K
FORTISBC POWERSENSE AWARD TO PURCELL STUDENT RESIDENCE FOR ENERGY EFFICIENCY MEASURES IN DESIGN AND CONSTRUCTION

CARBON EMISSIONS TRACKING REPORTING AND ACTIONS TO THE PROVINCE OF BC

SHIFT LAUNCH OF ANNUAL CAMPUS SUSTAINABILITY PUBLICATION

2011
CAMPUS HOSTED COMMUNITY TO PROMOTE SUSTAINABILITY
KELOWNA MAYOR'S ENVIRONMENTAL ACHIEVEMENT AWARDS REEL CHANGE SUSTAINABILITY FILM FESTIVAL
WORLD WATER DAY
BC GOVERNMENT'S CLIMATE ACTION SECRETARIAT'S REGIONAL CARBON ACTION WORKSHOP

COMPLETED & TARGETED FOR LEED® GOLD CERTIFICATION
FOR NEW CONSTRUCTION PROGRAM: HEALTH SCIENCES CENTRE ENGINEERING, MANAGEMENT & EDUCATION (EME)

EME TARGETED TO ACHIEVE 5 OF 5 LEED® INNOVATION IN DESIGN POINTS

SUSTAINABLE COMMUNITY DEVELOPMENT GRANT PILOT PROGRAM IN PARTNERSHIP WITH THE CITY OF KELOWNA

2012
PURCELL STUDENT RESIDENCE GETS REAP* GOLD LEVEL CERTIFICATION

* UBC's Residential Environmental Assessment Program

COMPLETED INTEGRATION OF EXISTING ACADEMIC BUILDINGS INTO THE CLOSED-LOOP DISTRICT ENERGY SYSTEM

COMPLETION OF AND AWARD FOR ARTS & SCIENCES BUILDING FIVE GREEN GLOBES FOR LEADERSHIP IN ENVIRONMENTAL & ENERGY PERFORMANCE

DEVELOPMENT OF NEW PARTNERSHIPS TO PROMOTE SUSTAINABILITY ON CAMPUS AND IN THE COMMUNITY WITH CITY OF KELOWNA, FORTIS BC AND SIERRA YOUTH COALITION

WORDS TO LIVE BY

Think globally, act locally has been bandied about for years, but at the Okanagan Sustainability Institute (OSI), it is a guiding mantra.

Under the leadership of director Professor Keith Culver, the OSI has a mandate to make the Okanagan as environmentally and socially sustainable as possible.

From his office at UBC's Okanagan campus, Culver and colleagues are busy forming partnerships with campus researchers and surrounding communities.

"Our initial focus is on water, urbanization and rurality and their interaction," says Culver, who took over as the OSI director in July 2011.

It is no secret the Okanagan is a great place to live, and as more people move to the region to take advantage of the amenities, it places a strain on vital resources such as water.

"We may be one of the first places in Canada to see water availability as a restriction to urban growth," says Culver.

Culver is forming partnerships with municipalities and the private sector. He sees the research underway at UBC's Okanagan campus as making a difference in the entire region.

One such partnership with the master-planned community New Monaco could have an impact in any part of the world with a similar climate.

Imagine a lawn that stays green no matter how hot and dry it gets with only a minimal amount of water. UBC researchers are not only imagining it, they are working towards the low-water lawn and New Monaco is providing the testing area.

Should the key to a waterless lawn be found, regions around the world with similar climates will likely take notice and want the drought-resistant lawn seed.

Community partners are also collaborating with researchers looking into using waste construction material for green roofs, or as fill for concrete. More materials that can be reused means less waste going into the landfill.

And it is not just Kelowna that benefits from the efforts of the university. Several OSI researchers will be presenting snapshots of their research to the City of Penticton Climate Action Committee, the first of many visits to community partners.

The OSI, in collaboration with Facilities Management and the Okanagan Sustainability Office, will host a green roof seminar and tour this fall. Up to 75 members of the Urban Development Institute and public will visit both operational and experimental green roofs on campus. They will hear from researchers and campus operations experts regarding the potential benefits of green roofs.

Culver envisions the Valley coming together as a single social and environmentally sustainable society.

"The OSI is dedicated to recognizing every discipline has a contribution to make," says Culver. "The community is very excited to have a world-class university campus in the Valley and we have an unparalleled opportunity to treat the Valley – from Armstrong to Osoyoos – as a living laboratory for social and scientific sustainability research. We have willing partners helping us."

Connecting the various private and public sector groups and agencies are Culver and the members of the Okanagan Sustainability Institute.

"I only want to help the membership of the institute go where they want to go," he says. "I have been up and down this valley to meet with public and private sectors to learn more about their sustainability needs."

Taking the pond by storm

The retention pond on the east side of UBC's Okanagan campus does a lot more than just hold water.

The man-made pond acts as a filtration system for storm water, preventing harmful materials from entering Okanagan Lake.

Roger Bizzotto, director of Facilities Management, says the pond was dug in the early 1990s with the purpose of collecting run-off storm water from the campus, rather than have it go into the City of Kelowna storm system which flows into the lake.

"It's considered a very sustainable practice," says Bizzotto. "We're not relying on the city storm water system and adding to their load."

Storm water containing salt, sediment and any other materials that are on the road, sidewalks and even the lawns of the campus first flows into a smaller pond, called a forebay, and are filtered out as the water enters the larger pond that is home to a variety of plants, insects and a few ducks in the summer.

"The reeds help to remove the heavy metals and impurities from the water. It's a self-cleaning process," says Bizzotto, adding the pond water then evaporates, continuing the cycle.

The forebay also acts as part of a trail system around the Engineering, Management and Education building. A planned project, called The Gathering on the east-west promenade, will extend the trail system.

Because there is no regular inflow and outflow of water, a plan was needed to keep the water from stagnating and developing an aroma.

To keep the water fresh, five to six bales of barley straw are spread out over the winter ice. When the ice melts, the straw sinks into the pond creating natural aeration.

Students see value in U-Pass Program

A Universal Bus Pass (U-Pass) Program was instated at UBC's Okanagan campus in 2007, in partnership with the UBC Students' Union Okanagan, BC Transit, the City of Kelowna and the Regional District of Central Okanagan. The U-Pass provides student holders a low-cost, sustainable transportation option: the transit service provided by Kelowna Regional Transit.

Aligned with a general fare increase proposed by the Kelowna Regional Transit partners, a student referendum was held in 2011 to determine student support for a $10 increase in the price of a U-Pass per semester per student. The students spoke loud and clear with 89 per cent of the voting students giving the green light to raise the bus pass from $50 to $60 per term, which is the same cost as a single-month adult pass.

The Senior Executive remains committed to a 10 per cent subsidy of the student U-Pass fees and the provision of the Transportation Hardship Fund in accordance with the agreement.

Green on top

Green roofs have been installed in three new buildings on campus: the Engineering, Management and Education building, Health Sciences Centre and the Purcell residence. Green roofs help keep the buildings cool in the summer and warm in the winter by providing a layer of soil and plants.

Because of the insulating properties the green roofs provide, less energy is needed in the summer and winter. It is another, low-maintenance way UBC's Okanagan campus is reducing its carbon footprint on the planet.

UBC's Okanagan campus is also conducting research to determine what construction waste can be used to make the beds for the green roofs. Once viable materials are found, they can be used to make a green roof rather than go in the local landfill.

The study has worldwide potential for any construction project where a green roof might be applicable.

For an in-depth story on green roofs, go to news.ok.ubc.ca/2011/07/07/making-green-roofs-greener

Fair Trade Fair

The inaugural Fair Trade Fair was held at UBC's Okanagan campus last year and another is being planned for this year.

"The idea was to bring awareness to the social and the environmental issues regarding fair trade," says Kamilla Bahbahani, equity advisor at UBC's Okanagan campus. The fair was held in November when people are looking for holiday gift ideas of something to celebrate the end of the semester.

Bahbahani says the idea behind the fair trade movement is to "allow workers to be paid a decent wage for the work they perform."

Groups such as 10,000 Villages are at the forefront of the movement, but the campus fair is also playing a significant role in raising awareness of the issue.

Sowing seeds

A plot of land near the University of British Columbia's Okanagan campus is doing a lot more than just growing plants.

The acre of donated land is the site of the UBC Organic Garden and Research Initiative (OGRI), but growing 100 per cent pesticide-free produce (based on organic principles) is only one of the benefits the soil is bringing to the campus and the community.

A portion of the fresh food is given to the Kelowna Community Food Bank and Kelowna Gospel Mission with the remainder being sold at the Kelowna Farmer's Market.

The project also aims to provide support and information to other groups that want to integrate environmental sustainability, social engagement and research into an organic garden and research initiative.

For more information, go to www.preservationfarm.net.

Starting with sustainable buildings

NEW CAMPUS BUILDINGS DEMONSTRATE LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN

East side of Engineering, Management and Education building

Reichwald Health and Sciences Centre

Purcell student residence

When plans were being made for the addition of five new academic buildings and more than doubling the number of student residences on campus, the buildings had to meet the needs of students, staff, faculty and the environment. The new buildings needed to be welcoming, functional, environmentally friendly and energy-efficient.

It was vital that the new facilities be designed with a minimal footprint. The Canada Green Building Council's Leadership in Energy Efficiency and Design (LEED®) principles were applied to ensure efficiency in energy use, water consumption, material selection and construction waste management, among many areas. Built to LEED ® Gold Standard, energy efficient technologies were incorporated into new academic buildings including the Engineering, Management and Education building (EME), the Reichwald Health Sciences Centre (RHSC) and the Purcell student residence featured here.

The EME consists of two, four-storey towers, common areas, lab rooms, meeting rooms, study rooms and a high-head lab. The common areas are bathed in natural light through windows and skylights. The upper and lower foyers serve as popular gathering places for students to work and socialize. A sense of welcome and space for collaboration contributes to the campus' social sustainability.

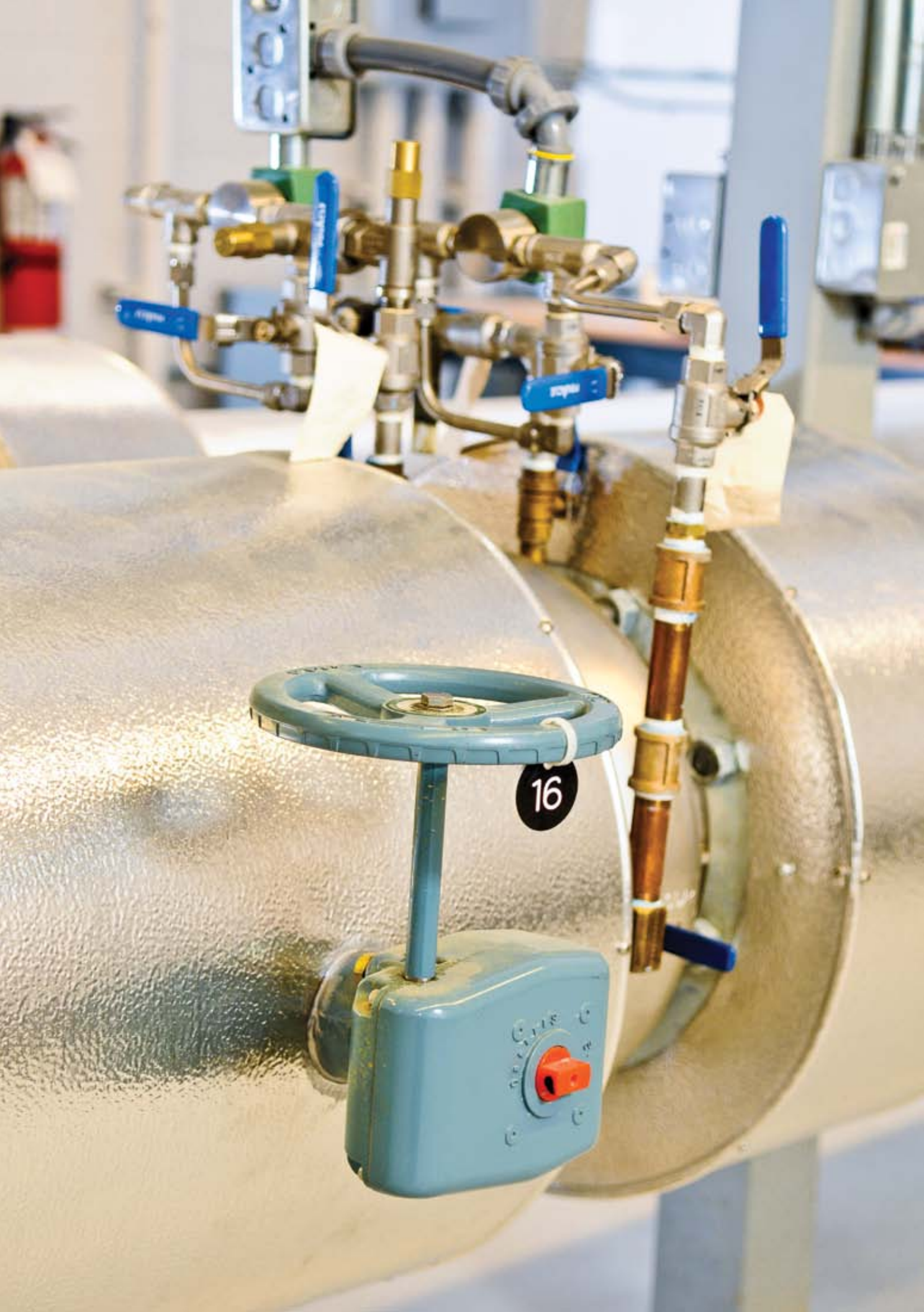
Anticipated to achieve 5/5 LEED® Innovation in Design points for clearwater utilization, education, green housekeeping and green power, the EME was also built for greater energy efficiency compared to a conventional building of similar size. The building is integrated into the campus' geo-exchange district energy system, which transfers heating and cooling energy from an aquifer water loop into campus distribution piping on a separate closed loop. At 17,000 square meters, the EME is anticipating a 42 per cent "regulated" energy savings over the base-level Model National Energy Code for Buildings.

The Reichwald Health Sciences Centre is also integrated into the geo-exchange district energy loop. The strategic use of glazing and shading devices provides shade along the eastern façade to further reduce the energy used to cool the building. Targeting LEED® Gold Certification, this building is anticipated to use 49 per cent less energy and generate approximately 285 fewer tonnes of greenhouse gas emissions than a conventional building of similar size.

Students housed in the newest residence on campus are also living in one of the most energy efficient residences. The 212-bed Purcell building has its own closed geo-exchange loop, and preliminary energy modelling demonstrates a 45 per cent savings over the Model National Energy Code for Buildings. Before this project was even complete, it was received $58,000 FortisBC PowerSense award for the energy efficiency measures adopted during the design and construction process. It was subsequently awarded UBC REAP (Residential Environmental Assessment Program) Gold Certification.

All three of the new buildings have incorporated green roofs. Plants are grown on designed matting on top of the building, which acts as an insulator and captures rainwater for rooftop irrigation. The RHSC has the largest green roof, which also serves as an acoustic dampener for the indoor classroom theatre. Great care was taken to ensure all three of the newest buildings were also as water-efficient as possible. Waterless urinals, dual flush toilets and low-flow, motion-controlled faucets are anticipated to reduce consumption by almost 40 per cent.


Tower 1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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 help us save energy and reduce carbon emissions," says Jackie Podger, associate vice president, Administration and Finance.

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.

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 Bizotto. 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.

Building a partnership for better buildings

FORTISBC AND UBC'S OKANAGAN CAMPUS TEAM UP FOR ENERGY EFFICIENCY

FortisBC and the University of British Columbia's Okanagan campus are working together on a partnership developed by the Okanagan Sustainability Office and Facilities Management to conserve energy and reduce carbon emissions from legacy campus buildings.

"The Building Optimization program fits into our objective to reduce campus energy use and meet our carbon emission reduction targets," says Jackie Podger, associate vice president of Administration and Finance. "Our partnership with FortisBC will help achieve those goals."

Carol Suhan, manager, FortisBC PowerSense Services, says the Building Optimization Program is a three-year program that will help the university reduce its consumption of both electricity and natural gas.

In the first phase of the three-year project, FortisBC will install software in most of the original campus buildings, which were constructed in the early 1990s. Taking into account weather and occupancy variability, the software will monitor real-time energy use and identify anomalies so building control changes can be made. An in-depth custom engineering study will also determine where and how energy is used. This will result in recommendations on how best to reduce energy use.

"Roger Bizzotto, director of Facilities Management, and his team of experts are deeply committed to the project," says Leanne Bilodeau, director of Sustainability Operations, adding the program would not be possible without the support and leadership of Bizzotto and his team.

"The engineering study will come up with recommendations for potential energy savings," states Bilodeau, adding that through Kara Serenius, FortisBC PowerSense engineer, Fortis BC is financing the software and engineering study, while UBC will fund the implementation of recommendations for projects on the phase-one buildings that will net a payback period of two years or less.

"These are usually identifying operational improvements and investing in smaller energy saving measures like sensors and controls," says Bilodeau. "They are smaller things that can add up to fairly substantial energy and utility cost savings."

For example, the installation of something as simple as occupancy sensors in the Science building can result in an approximate annual predicted savings of 6,000 gigajoules, and 300 tonnes of carbon emissions, all within a payback period of 1.3 years.

"The Building Optimization Program provides us with the framework to implement these types of projects and calculate actual energy, utility cost and carbon savings," she says.

Suhan, Serenius, Bilodeau and Bizzotto project a five per cent reduction on gas and electrical use in the original campus buildings, but are hoping to achieve 10 per cent.

While those numbers may not seem high, considering the size of the buildings being optimized, energy savings are projected to be substantial.

Together UBC and FortisBC will work toward energy savings measures that will help achieve greater energy efficiency and building operational savings -- all while contributing to reducing UBC's environmental footprint and meeting the institution's ambitious carbon emission reduction targets.

From left: Leanne Bilodeau, director of Sustainability Operations; Kara Serenius, FortisBC PowerSense engineer; and Jackie Podger, AVP Administration and Finance.

FACING PAGE: Carol Suhan, manager, FortisBC PowerSense Services.


UBC
OKANAGAN
Facilities Management
Rob

Waste not want not

RE-PURPOSING EQUIPMENT AND MATERIALS IS A DAILY PRACTICE IN FACILITIES MANAGEMENT

Recycling at UBC's Okanagan campus covers a lot more than paper and cardboard.

Desks, chairs and just about any manner of office equipment that can be reused and repurposed will be found a new home.

Rob Buonomo, facilities coordinator, says it makes sense to reuse as much material as possible. Buonomo will even keep the stripping around a desk for use on another desk when needed rather than throw away a perfectly good item.

A prime example of reusing items was when it came time to move faculty and staff into the new Engineering, Management and Education building (EME). Many of the faculty destined for the EME were working out of portables while waiting for the EME to open.

They had complete offices in the portables, but when the move was made, the new offices came with desks and chairs so Buonomo used the older desks and chairs for graduate students.

"I inherit all this stuff and then I find a home for it," he says, adding the items are put in short-term storage until they are needed. "When I get a work order, I go and talk to them and see if I have what they need.

"If there are items I can't reuse, I contact the school board to see if they can use them. If not, we call the Salvation Army or other non-profit organizations in our community such as Girl Guides or Scouts Canada to see if they can use it. We try to recycle everything we can."

Office equipment that cannot be reused is broken down with the wood, metal and other materials being recycled accordingly.

Old chairs are stripped of parts that are in working order and used to repair other chairs, meaning fewer chairs have to be purchased and less material is sent to the landfill. Desk drawers and their sliding mechanisms are also kept as repair parts.

"We try to recycle as much as possible," says Buonomo. "We even have a light bulb recycling program."

Because florescent lights contain small amounts of mercury, Buonomo is working with the Battery Doctor in Kelowna to recycle the long glass tubes.

"They take apart the tube and take out the mercury and then ship it off to be responsibly handled," he says.

Buonomo said there is a fee for the service, but it is an environmentally responsible option that is much more cost-effective and safe than purchasing a machine to separate the mercury from the bulbs on campus.

Another bright idea to help save energy is currently taking place. The university is replacing all of the older florescent tubes with newer, more energy-efficient models.

"It's a huge project, but in the long run it will be more efficient," he says. "The bulbs are also cheaper and they last longer, and Fortis BC rebates the program."

Aaron Heck, client services manager for IT, media and classroom services, says the goal of IT Services is also to reuse and recycles as much as possible.

Whenever possible, copiers are reused and reallocated to areas they are needed.

"For desktops, we re-used equipment retired from instructional computer labs for administrative and faculty loaner equipment to provide flexibility for all faculties and departments," says Heck. "When new non-permanent staff are hired, they are issued this loaner equipment. This helps keep the purchase or lease of new equipment to situations where new positions are permanent and ongoing.

"For laptops, we re-used laptops recovered under our computer replacement program as loaners and spares in a manner similar to desktops. A large pool of older [three plus years] laptop loaners also meant we were able to accommodate a large number of specialized one-time requests for laptops for event support or special course work."

Kelowna teams up with university for sustainable future

In 2011, the Sustainable Community Development Grant Pilot Program was launched. The project was a partnership project between the University of British Columbia, Okanagan campus and the City of Kelowna. "The grant was developed for the purposes of providing faculty, students and staff the opportunity to work with City staff and community members to apply sustainability-related research and learning in the community," says, Leanne Bilodeau, director of Sustainability Operations, who was involved in the development of the project with the Provost and Vice Principal, AVP Administration and Finance, City of Kelowna Mayor and City Manager. "The concept was to facilitate community engagement, capacity building and actions to advance shared sustainability goals".

The Glenmore community was selected by the City of Kelowna as the project pilot site, given its demonstrated engagement in sustainability related projects such as "Cool Ways to School," which promotes safe, healthy, sustainable transportation options to local schools. Now, Glenmore will be at the centre of sustainability projects aimed at helping the environment.

Three research projects were awarded funding by UBC's Okanagan campus, under the terms of the grant: the social potluck – social sustainability through local food and story, reducing potable water use in civic parks and the sustainable transportation ComPASS pilot project.

Several workshops held by the Okanagan Sustainability Office facilitated stakeholder dialogue and collaboration throughout the process. During the final public forum, faculty members, students, City Staff and community members expressed the benefits associated with the pilot program.

Community members expressed the benefits associated with the program such as, the collaboration built between the University and the neighbouring community; the potential to improve their community; and the partnership between the University and the City. Community members said the program increased their levels of awareness regarding sustainability issues and actions they could undertake to support sustainable development in their community. All respondents surveyed about the program expressed its value and recommended that it be continued and expanded upon.

RAMONE LAWRENCE

KEEPING THE GRASS GREEN AND THE WATER IN THE LAKE

There's just no getting around the fact that to have green spaces you need to use water.

And being in such a dry part of the country, keeping parks, golf courses and other areas green means you need a lot of water.

But UBC's Okanagan campus research is looking at ways to keep water use to a minimum while still maintaining green spaces for the community to enjoy.

Ramon Lawrence, associate professor of computer science, along with Ph.D. student Scott Fazackerley, and undergraduate students Andrew Campbell and Ryan Trenholm, developed and deployed sensor technology to reduce water used by irrigation at Senora Park in the Glenmore area as part of the Sustainable Community Development Grant Pilot Program. The program is a partnership between the City of Kelowna and the university.

The summer study is another way the university and community are working together to search for sustainable practices that will benefit the entire region. From May to October 2011, sensors placed in the park monitored the moisture level in the soil, determined when water was needed, and then operated the irrigation system accordingly.

Like most area parks, Senora Park has an automated watering system that comes on at certain times on certain days – like clockwork – even if the water is not necessarily needed.

"We can do better than that by making the irrigation system smarter," says Lawrence.

The sensors do just that. The sensors were placed in certain areas of the park and would only use the sprinklers when the moisture in the soil dropped below a certain level.

"It takes any human planning out of the loop," he says. "There is no more human error to decide when the watering will take place. The information gathered by the sensors is also put on a website to better track when water is needed."

The computer science team designed a system that adapted water use to actual conditions, aiming to reduce the amount of water wasted. The approach used three different nodes: a moisture sensor placed into the soil to collect information on the amount of water present; a sensing node responsible for scheduling and reporting soil moisture readings; and a controller node responsible for controlling and scheduling irrigation times and duration. All information was transmitted wirelessly, eliminating the need for costly wiring. The result of the adaptive watering program was 54 per cent less water usage with no noticeable effect on the appearance of the lawn.

Lawrence says there are a lot of uses for the sensors, not only for parks but for agricultural and vineyard applications. Getting rid of the green spaces entirely would dramatically reduce the amount of water being used, but it is not a realistic option.

"Although xeriscape and other sustainable landscapes reduce water usage, they are not very practical for kids to play on," he says.

Lawrence says studies have shown a large percentage of all water usage in Kelowna is to irrigate landscaping and while the sensors can help reduce the amount of water used, they are still too expensive compared to the cost of the water.

However, there are major companies developing these technologies and Lawrence says that could bring the price down to a level more home owners, and municipalities, can afford.

"Whatever we can do to save water will make a big difference," he says. "This can be used not just in Kelowna, but anywhere you are using outdoor irrigation systems. Substantial water savings will occur as this technology is widely deployed."

GABRIEL NEWMAN

EAT, DRINK AND SHARE A STORY

There was a time when people used to sit around the dinner table with friends and family telling stories and sharing their lives, but with the onslaught of distractions such as TV, computers and other devices, that communal sharing has been all but lost in recent years.

Gabriel Newman is resurrecting the art form of storytelling through his social potluck project – a project that contributes to the social and cultural sustainability of our communities.

The Master of Fine Arts degree student at the University of British Columbia's Okanagan campus used the Glenmore area of Kelowna for the project that brought people together to tell stories ranging from the heartache of putting a child up for adoption to how a deformed finger came to be.

"It was whatever story they wanted to tell," says Newman.

The project was funded through the Sustainable Community Development Grant Pilot Program which is a partnership project between the University of British Columbia Okanagan campus and the City of Kelowna.

"Social potluck is a template for creating community story telling performance projects," says Newman. "I can go in different communities and create a unique performance that is all about them and their stories."

Newman hosted a potluck dinner where he would provide the food and those in attendance would provide the stories. He then created a performance based on those stories and the participants would again gather, this time each bringing food for the potluck.

Newman says a lot of input people have today comes from an outside source, such as TV or the Internet, but the social potluck allows people to "create their own culture by telling stories around the dinner table."

The potlucks also create a sense of community and social sustainability among neighbours.

"The project brings people back to live performances without the influence of outside media, says Neil Cadger, associate professor in the performance program and head of the Department of Creative Studies within the Faculty of Creative and Critical Studies.

"It is visual. It includes the whole body," says Cadger. "It is not just about the words. It is the food being exchanged. The food itself is part of the communication. You can't communicate that sense of taste, smells and sound any other way. It's really an important thing to do: to bring back the storytelling."

Newman says the nice thing about story telling is "it is something we all have the capacity for. It is entertaining to just sit and listen to people share their stories."

The stories not only generate a feeling of community, but they help people see their neighbours in a different light, a more familiar light.

"It's really easy not to meet your neighbours," says Cadger, adding people do not even have to attend social gatherings like a movie theatre anymore because they can watch movies in their basement via a number of avenues.

"Social sustainability has to do with sharing. Those systems of sharing can be substantial," says Cadger. "If not there will be consequences in other areas."

Adds Newman, "It's in the small acts that you will have big results."


SPECIAL
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GORDON LOVEGROVE

PARK THE CAR, TAKE THE BUS, HELP THE ENVIRONMENT

Only a fraction of people use public transit, but Gord Lovegrove is hoping to change that.

The assistant professor in the School of Engineering at UBC's Okanagan campus is looking into ways to encourage entire families to take advantage of the local bus system.

ComPASS is a concept where mom, dad and the children all receive bus passes and leave the family car parked as much as possible.

Lovegrove says not only will taking the bus generate an economic benefit for the family, but it will also benefit the environment.

"The average trip in our city is five kilometres," says Lovegrove, who rides his bike or takes the bus to work. "People don't need to drive five kilometres. They can walk, or take a bus or ride a bike. Only two per cent of people (in the area) take public transit."

Lovegrove is basing ComPASS on a similar program that has proved very successful in Boulder, Colorado with ridership reaching an impressive 33 per cent of the population. Another 33 per cent ride their bikes, while the remainder still hit the gas pedal to get to their destination.

Reaching those numbers in Kelowna is possible, as 85 per cent of area neighbourhoods have access to public transit. The Glenmore neighbourhood of Kelowna is providing test families for the trial.

Lovegrove is partnering with the city and other agencies to provide 18 families with free bus passes for three months. As an additional incentive to walk, cycle, and/or take transit, local merchants are also getting involved, including passes to the local Parkinson Recreation Centre, which got on board by reducing the price of activity passes for the university project by 50 per cent. This reflects the Community Revenue Neutral Model (CRNM) that has worked so well in Boulder, whereby prices paid are based on actual revenues received from the group of participating residents. Using this CRNM, the City of Kelowna has also provided reduced-price transit passes so Lovegrove could conduct the study.

The 18 volunteer families will then be monitored for 12 weeks to see how much they actually ride the bus. Based on the success of the Boulder program, Lovegrove is expecting some impressive results and he anticipates ridership could double.

"That has happened elsewhere," he says. "It means less car use and that's the direction we want to go. It's about a more sustainable community – what can we do in our neck of the woods?"

Phase one of the project found strong support for ComPASS, with 75 per cent of the people surveyed in the Glenmore neighbourhood either saying they would participate or are interested in the idea.

"We're engaging the community. This makes sense economically and it helps the environment. People really want to do the right thing," he says. "People want to prove this is possible. I've already had interest from Rutland. There are of neighbourhoods in Kelowna where this can succeed."

Lovegrove says first-phase results showed residents were willing to pay an average of $30.50 for their preferred ComPASS package. Based on the community revenue neutral model and assuming 100 per cent participation in the study area, these components could be offered for less than $20 per household per month, which is significantly less than the average willingness to pay.

Residents overall indicated that they are willing to use more active modes of transportation given a safe and convenient opportunity.

With high support, willingness to change, and the ability to provide a ComPASS at an attractive price, the viability of a ComPASS in the Glenmore community looks promising.

Beyond sustainable labs

LAB LEADERS USE SOME CREATIVE THINKING TO BENEFIT STUDENTS AND ENVIRONMENT

The fewer chemicals used the better. In an effort to reduce waste, cut costs and help the environment, science labs at UBC's Okanagan campus are taking an innovative, sustainable approach to classes.

Biology labs have done away with real blood and urine, in favour of simulated fluids to the benefit of students and the environment.

Donna Young, lab manager in the biology department, says using real urine and blood presented a variety of hazards to the students and created environmental issues, so she and a summer student started looking at alternatives.

Young found a recipe for artificial blood and urine, not only eliminating health risk to students, but also the need to dispose of contaminated materials, such as plastic cups, that come in contact with the human fluids.

In the chemical department, Ed Neeland, associate professor of chemistry, has developed a way to re-use chemicals, drastically reducing the amount of substances requiring proper disposal.

Neeland says disposing of the chemicals after each class had used them "seemed terribly wasteful" so he devised a method to bring the chemicals back to their original state, allowing them to be used repeatedly.

"If you did it right in a circular way, you would end up with the original chemical," says Neeland. "The waste would be minimal. It's costly and it takes energy to get rid of the chemicals. We also do not have to buy more material because the students have already made it."

Natasha Murphy, environmental chemistry major, spent last summer working on the Cascade Chemical project and was pleased to discover Neeland's ideas worked well.

"My last product was what I started with in the first place. It was a complete circle. It was a really interesting learning experience and with a little more work it could work really well in labs."

Young began a quest to replace the human fluids with safer and more environmentally friendly versions while ensuring the students get the same educational value from the replacements. She found some suitable replacements, but they were expensive to purchase.

So 'recipes' were discovered online and the lab now makes their own artificial blood and urine, at a substantially lower cost.

"Up to 1,000 students (per year) were working with blood and urine," says Young. "There are many potential risks exposing that many students to bodily fluids."

Plus, a huge amount of waste was generated that was classified as a biohazard that needed proper disposal.

"Of course, we have to pay to get rid of those materials," says Young. "Anything that came in direct contact with bodily fluids must go in the biohazard waste, creating lots of additional costs."

By creating the simulated urine in bulk, the need for hundreds of small, plastic containers is eliminated. The students used to supply the urine samples themselves and once those tiny cups were used, they had to be treated as a biohazard.

"It means less material that will go into the landfill," says Young.

But Young was not done there. She noticed stacks of disposable purple rubber gloves were piled up at the end of the day, creating more chemically contaminated waste.

The solution was simple, cost effective and good for the environment: Young simply purchased reusable rubber gloves from a local dollar store.

At the end of the class, students merely wash the gloves, hang them to dry and the same pair can be reused many times.


HAWAII

Hi, my name is Peter

TEAM EFFORT KEEPS WASTE TO A MINIMUM

Anyone who has been at UBC's Okanagan campus for any amount of time has met Peter.

With a big smile and a ready handshake, Peter has greeted thousands of people on campus over the years as he spends his days gathering recyclable materials that are then sent to area recycling plants. During his time at the university, Peter has helped divert tons of material from the landfill and is a key contributor to the campus-wide recycling program.

Peter works at UBC's Okanagan campus through the Kelowna and District Society for Community Living. The KDSCL is a not-for-profit advocacy organization, governed by a volunteer board of directors that provides services to people with developmental disabilities and their families.

Al King, facilities manager, brought KDSCL to campus almost 20 years ago and the society members have been fastidiously collecting all manner of recyclables ever since.

"It's really neat. A lot of them have been here a long time," says King, who speaks with an obvious fondness for the workers who take great pride in their work, even taking the time to separate items like refundables, into appropriate containers.

"They are an extremely hard-working crew," says King. "They take their duties and tasks very seriously."

Charisse Daley, KDSCL executive director, says there is a definite bond between the KDSCL clients and the university staff and faculty.

"We've been involved for many, many years," says Daley. "The partnership we have has been wonderful."

The KDSCL has nine people working part-time at the Okanagan campus who look forward to coming to work.

Their job may be to collect the recyclable materials, but their daily routines also provide a bit of a social outlet for the workers and between emptying bins full of recyclable materials, they often take a few minutes to chat with their university co-workers.

"The UBC staff and professors have been great. It's been a wonderful experience," says Daley. "The staff have been so welcoming. They really are like co-workers."

Along with its commitment to being environmentally responsible, UBC's Okanagan campus is also mindful of its corporate social responsibility to contribute to the community.

Daley says she applauds the efforts of the university in recycling as much material as possible and in working with KDSCL to deliver its services.

King says the campus also actively recycles Styrofoam and is working with a local inventor to recycle the material rather than dump it in the landfill. In one year, 120 cubic yards of Styrofoam was sent to the inventor who compresses the material and turns it into a form of gravel that can be used for drainage applications.

Rather than see wood pallets thrown on the landfill pile, King has arranged to send them to a business in Armstrong where they are made into lawn furniture.

UBC has numerous recycling activities to preserve natural resources, save energy and reduce the amount of solid waste generated on campus and sent to the local landfill.

This year, the composting program went campus-wide with yellow bins set up in every building to collect waste. The composting program collects 2,000 pounds of kitchen organics each month, plus another 1,000 pounds of organic waste from the rest of the campus. Composting drop off containers can be found next to the recycling stations on the first floor of every building on campus.

Revenue generated by the cardboard recycling goes directly back into the composting program and King has plans to install a second composter this summer.

UBC's Okanagan campus has extended its recycling services to include all types of paper, plastics, aluminum and special items including batteries, fluorescent bulbs and ink cartridges.

There are approximately 9,000 people on campus on any given day which generates a significant amount of waste. The vision of UBC's Okanagan campus is to minimize the waste stream to become a near zero-waste campus, eliminating materials used that end up in the garbage, and diverting the "waste" stream into the recycling bin and into products that can be used again and again.

To help achieve this goal, offices and classrooms are equipped with blue bins for office paper, cardboard and other paper products. Additional recycling stations for refundable materials and other items can be found throughout the campus as well.

Students take the lead

UBCYCLES TO THE RESCUE

Want to help the environment and get in shape by cycling to class but don't have a bicycle?

UBCycles, formerly known as UniCycles, is a program where staff, faculty and students at the University's of British Columbia's Okanagan campus can sign out a bike to get to and from campus.

Meshkat Javid is the UBCycles coordinator and an avid cyclist.

"First and foremost we want to provide services for cycling at the university and to try and facilitate alternate ways to get to the campus," says Javid. ""It's just a matter of sustainability. Every September the parking lots are pretty full and access to busses is an ongoing issue. It's just better to jump on a bike and ride to school. We want to make cycling to the university a viable option."

Chelsea Butchart, Campus Life student event coordinator, says the program is a popular one.

It is not uncommon for all of the bikes that were donated to the program by the public, to be signed out.

"I was impressed to see the student's response and how many volunteers there were," says Butchart, adding the plan is to start the program up again in September when students are returning to class for another year of study.

Butchart says students will also be shown the safest route to the campus as well as offering tips for cycling around Kelowna.

UBCycles organizers also have plans to expand on the city's Bike to Work Week, with a Bike to School Week event.

The main goal of the program is to get more people out of their cars and using pedal power to get to the campus.

Those wanting a bike must provide some basic information before they can ride away fully kitted with the bike, a helmet, light, small repair kit, tire pump and a lock.

The best part is it is all free. The bikes have been donated to UBCycles from members of the community and there is no charge to those signing out a bike.

Javid says people can also bring their bikes to UBCycles, located in the UNC, and repair them. It is just another incentive to get people to pedal to school.

TURNING OUT THE LIGHTS TO WIN

Turn out the lights and win one for the home team - or more accurately, the home dorm.

The Energy Cup was born out of Save the World Week and is a student-driven competition to see which residential housing complex can reduce their consumption of energy the most.

Chelsea Butchart, student events coordinator with Campus Life, says the Energy Cup is a way to get students actively involved and thinking about ways to reduce everyday energy consumption.

Monthly competitions are held to see which building can claim the biggest reduction in the use of electricity and natural gas with an overall winner being named at the end of the term.

With the support of the Okanagan Sustainability Office, the official competition started in January and Butchart would like to see the Energy Cup become an annual event.

The residential advisors host a variety of events to promote power-saving ideas and to keep track of the energy being used.

At the end of the year, the winning residence will get a pizza party, a small trophy and, of course, bragging rights.

"The goal is to reduce energy use and to provide information to the students on how to reduce energy use," says Butchart. "Since the competition started, energy use has been decreasing."

ENVISIONING A SUSTAINABLE FUTURE

UBC's Okanagan campus has developed sustainability initiatives and commitments that deeply align with advancing *Place & Promise: The UBC Plan and the Okanagan Strategic Action Plan*.

The campus is committed to responsible stewardship of sustainability at all organizational levels, to reduce our environmental impact and embed a culture of sustainability. The Okanagan Sustainability Office was established to help deliver on UBC's sustainability commitments and aspires to foster leadership across the campus to help achieve our collective goals and to broaden the impact of sustainability.

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a place of mind