2012 Carbon neutral aCtion overview report

a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

sustainability

Okanagan campus

Envisioning a sustainablE FuturE

The UBC Okanagan campus has developed sustainability initiatives and commitments that support and advance *Place & Promise: The UBC Plan*.

The campus is committed to continue to responsibly steward 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 broaden the impact of sustainability.

this report was produced by the university of british Columbia's okanagan sustainability office. it supplements the Carbon neutral action template and provides a high-level overview of the actions taken by the campus to reduce carbon emissions and create a culture of sustainability.

ACknOwledgemenTS

Many campus sustainability leaders have contributed to the development of this report. Your ongoing commitments to sustainability, collaborative spirit and accomplishments have been instrumental to the advancement of our collective sustainability goals. We thank you for your contributions.

Facilities Management: roger bizzotto, Martin gibb, Colin richardson, allan King

it services: Don thompson, steve rosco, aaron Heck

supply Management: Denis silva, Paula goldspink, Dave adel

Prepared by:
leanne bilodeau, Director sustainability operations, okanagan sustainability office with the support of anna rankin and Joann rennick brown, okanagan sustainability office
Designer: Margo Yacheshyn

university of british Columbia
okanagan sustainability office
3333 university Way
Kelowna, bC v1v 1v7
www.ubc.ca/okanagan/sustainability

ContEnts

ExECutivE suMMarY

2012 marked the first full year of campus operation since the completion of the build-out in September 2011. despite full occupancy of the engineering, management and education Building and the reichwald Health Sciences Centre in 2012, the campus achieved an absolute reduction in building greenhouse gas emissions, reporting 3,135 tCO2e in 2011 and 3,124 tCO2e in 2012, respectively. This significant achievement can be attributed to a focus on green building design, the closed loop geo-exchange district energy system and ongoing operational commissioning. Overall, while the campus has increased its floor area by 95 per cent since 2007, it has improved its tCO2e efficiency per square metre over 2007 building emission baselines by 27 per cent.

The closed loop geo-exchange district energy system achieved full operation in 2012, with the integration of original academic buildings into the loop. Serving academic buildings on campus, the system transfers heating or cooling energy from an aquifer water loop into campus distribution piping on a separate closed loop and is a significant engineering achievement toward increased utilization of renewable energy on campus. The transfer of waste heat from the administration building data centre was enabled in 2012, and optimization is ongoing.

while the campus has focused on achieving leed® gold standard or equivalent on new construction projects, in 2012 the campus finalized an agreement with FortisBC to optimize the performance of its original academic buildings. The three-year Building Optimization program allows for real-time energy consumption data collection on nine buildings and retro commissioning of five original campus buildings. Through the analysis of the baseline data currently underway, the program will provide detailed recommendations to achieve 5-10 per cent energy savings through physical retrofits and controls optimization. A publicly accessible pulse energy dashboard was launched in 2012 that demonstrates real time energy consumption in all nine buildings. Staff, faculty and students can log onto the dashboard at any time and observe energy consumption in nine buildings over the past week, month or three-month periods. The system also provides detailed data over longer periods for deeper analysis by Okanagan Sustainability Office and Facilities management Teams.

in 2012, FortisBC presented powerSense Conservation excellence and leadership awards to the campus for outstanding achievements in energy conservation in new construction and conservation projects. The campus received over $200k in rebates and $150k in annual utility savings. lighting retrofits completed in 2012 alone will save the campus 196,000 kwh annually.

going forward, the campus will continue to focus efforts on advancing campus operational sustainability. The power of You, a two-year behaviour change energy reduction engagement strategy developed by the Okanagan Sustainability Office, will be deployed in 2013, initially targeting staff and faculty in academic buildings. Through collective action toward energy conservation behaviours, it is anticipated that the campus will achieve greater reduction in energy consumption over the course of the two-year program than the building optimization program could achieve alone. The Okanagan Sustainability Office will work with stakeholders to develop an operational sustainability plan to guide our actions over the coming years.

michael shakespeare
Avp Administration and Finance
University of British Columbia,
Okanagan campus

2012 grEEnHousE gas EMissions

The following greenhouse gas emissions have been quantified using the BC provincial government's SmArTTool reporting Framework.

Total emissions calendar Year	3,317 tcO2e
buildings	3,123.5 tCo2e
Mobile Combustion	45.4 tCo2e
office supplies	75.5 tCo2e
Fugitive	72.6 tC02e

FugiTive emissiOns

The following fugitive emissions have been deemed by the British Columbia provincial government as out of scope for reporting:

- Gases used for research and medical purposes
- Type R22 HFC's from refrigerating units on campus
- Any emission sources that comprise less than 1% of the campus total gHg's

in-scope HFC's have been tracked by the campus since 2010. in 2012, in-scope HFC's amounted to 72.6 tCO2e, approximately 2.2% of total emissions. Fugitive emissions over 1% are reportable and have been included in the Total emissions Calendar Year 2012.

The Okanagan Sustainability Office, working closely with Facilities management, remain committed to tracking and monitoring HFC's and to making adjustments where possible to minimize future emissions from these and all sources.

oFFsEts aPPliED to bECoME Carbon nEutral in 2012

Total emissions offset to become carbon neutral in 2012 as provided by SmArTTool as "total for offset" is 3316 tCO2e. One tCO2e reported as part of our greenhouse gas emissions profile in 2012 does not require offsets. As stated in BC Best practices 2012 methodology for measuring greenhouse gas emissions, the carbon dioxide emissions resulting from biogenic fuel sources must be reported but do not require offsets.

CHangEs to grEEnHousE gas EMissions anD oFFsEts rEPorting FroM PrEvious YEars

Following the public release of the 2010 and 2011 Carbon neutral Action Overview report, it was determined that the total emissions and offsets applied for buildings and mobile fleet required adjustment. For 2010 calendar year offsets were under reported by 2 tCO2e. (This is in addition to an adjustment made in 2011 for 2010 calendar year where emissions were under reported by 3 tCO2e.) in 2011 emissions were over reported by 3 tCO2e.

ovErPaYMEnts to PaCiFiC Carbon trust

The net difference of -1 tCO2e in offsets required have been adjusted in the 2012 offset payment form and applied against the 2010 and 2011 emissions reported in SmArTTools.

EMissions rEDuCtions aCtivitiEs

acTiOns Taken TO reduce greenhOuse gas emissiOns in 2012

The following provides a high-level overview of specific actions and targets reported in the CnAr Actions Table attached.

a. mobile Fuel combustion

Adjustments from previous reporting years affected the fleet emission totals for 2010 and 2011. Adjusted amounts were 68 tCO2e for fleet in 2010 and 53 tCO2e for fleet in 2011. in 2012 the downward trend continued with fleet accounting for 45 t CO2e. This is a 34% reduction in fleet emissions since 2010. Fleet comprises 2% of total emissions.

acTiOns

- Continued stewardship of sustainable mobile fuel combustion through adherence to Sustainable Fleet procedures, replacement of retired fleet vehicles with electric and energy efficient models, and ongoing training and education to support sustainable fleet use. in 2012 one gas golf cart was replaced with electric.
- Further education on the existence and location of electrical vehicle charging stations on campus.
- Implementation of measures to reduce reliance on fleet vehicles and divert the number of trips taken by encouraging fleet carpooling, walking or cycling.

B. stationary Fuel combustion, electricity and Fugitive emissions (Buildings)

Buildings are the largest source of green House gas emissions on campus. Stationary building emissions accounted for 3,124 tCO2e in 2012. Between 2007 and 2012 energy consumption per square metre of building space dropped by 27% despite an increase in building space of 95% and student FTE increase of 81%. A focus on green-building design and infrastructure has contributed to avoidance of greenhouse gas emissions as compared to building by conventional design.

The campus's geo-exchange district energy system has been fully implemented in 2012 and is in the retro-commissioning phase of its development. in 2012, the transfer of waste heat from the administration building data centre was integrated into the loop, and optimization is ongoing. The system provides energy sharing between buildings, heat re-capture, thermal storage and flexibility for future fuel switching.

in partnership with FortisBC and pulse energy, UBC's Okanagan campus has initiated a three-year Building Optimization program. The program provides real-time data to monitor energy consumption changes over days and weeks. results of a baseline assessment will inform optimization plans and energy conservation in original academic buildings.

acTiOns

- Ongoing retrofits for HVAC and occupancy sensor controls were completed on all laboratories and theatres in all existing buildings in 2012.
- Additional 3,600 T-12 ballasts changed to T-8 on campus in 2012 with a direct rebate applied to purchase cost. This retrofit saves the campus 196,000 kwh annually.
- Solar powered signage lighting was installed on all academic buildings.
- Blinds on second floor of Arts building were replaced, blocking UV light and insulating rooms.
- Successful recapture of waste heat from the Administration building data room to the geo-exchange district energy System.
- Launched Pulse Public Energy Dashboard to monitor consumption and provide building occupants with real time feedback.

c. supplies (paper)

acTiOns

- Formation of ITPAC (Information Technology Procurement Advisory Committee); bringing together multiple iT groups from both campuses.
- Developed new T & E (Travel & Expense) Program which will reduce the need for paper requisitions.
- More than doubled the amount of units on campus under the XGS agreement since 2010 (ensures unit consolidation where applicable and end-user training of sustainable features such as double-sided print).

Plans to ContinuE rEDuCing grEEnHousE gas EMissions 2013-2014

a. mobile Fuel combustion

- Work with transit authority to improve anti-idling practice on campus.
- Continued replacement of retired fleet vehicles with electric and energy efficient models.
- Encourage the purchase of energy efficient models where new fleet vehicles are required.
- Planned implementation of a new multi-purpose pathway/corridor to the campus in partnership with the City of kelowna and the ministry of Transportation and infrastructure.

B. stationary Fuel combustion, electricity and Fugitive emissions (Buildings)

- Roll out the implementation phase of the Building Optimization program for original campus buildings, in partnership with FortisBC. develop energy management plans.
- Move towards reducing space to align with space standards in office areas.
- Launch a two-year behaviour-based campus engagement strategy to engage building occupants and reduce energy consumption in all academic buildings.
- Provide education to campus on Pulse Public Energy Dashboard to monitor consumption and provide building occupants with real-time feedback.
- Minimize fugitive emissions through maintenance. Plan a design review for related equipment. determine root cause and address maintenance issues/upgrades as budget allows. Continue to monitor and report emissions.

c. supplies (paper)

- Continue to promote 50% post-consumer recycled paper content.
- Supplier to add the option of wheat paper to the custom list as a tree free paper alternative.

aBOve and BeYOnd:
Additional Measures to Reduce Emissions and Promote a

innovation anD rECognition

awards

in 2012, UBC's Okanagan campus received over $200,000 in FortisBC powerSense rebates for leadership in energy efficient design of new construction and energy conservation measures in original facilities that will save the campus $150,000 in annual utility costs.

Both academic and residential projects combine innovative and sustainable development technologies with a focus on energy conservation, water conservation, and sustainable construction practices. Awarded projects include the Arts and Sciences ii Building, the engineering, management and education Building, the reichwald Health Sciences Centre, the geo-exchange district energy System and the gym lighting retrofit project.

Additional awards and acknowledgement received in 2012 include:

- Thompson Okanagan Commercial Building Awards for Purcell Student residences and the campus geo-exchange district energy System.
- The first campus in the world to achieve Five Green Globes distinction for the Arts and Sciences ii and the Charles e. Fipke Centre for innovative research Facilities.
- Featured profile in the SICA Construction Review, the Official publication of the Southern interior Construction Association.

geO-exchange disTricT energY sYsTem

The campus's geo-exchange district energy system is designed to demonstrate innovation in renewable energy. it provides heating and cooling to all new academic buildings and heating to all original academic buildings on campus. A key component to reducing natural gas consumption and associated utility costs and carbon emissions, the system has been fully implemented in 2012 and is in the retro-commissioning phase of its development. in 2012, the transfer of waste heat from the administration building data centre was integrated into the loop, and optimization is ongoing. The system provides energy sharing between buildings, heat re-capture, thermal storage and flexibility for future fuel switching.

BelOw: lorne Antle, project manager for UBC properties Trust, leanne Bilodeau, director of sustainability operations for the Okanagan campus, mark warren, FortisBC director of customer service, michael Shakespeare, AVP Administration & Finance for the Okanagan campus, and Shelley Thomson, FortisBC energy solutions manager.

FeaTure award-winning energY cOnservaTiOn prOjecT

Optimizing space use & energy conservation: gym lighting replacement project

The UBC Okanagan recreation Facility is a state-of-the-art facility that provides the venue for many provincial, national and international events. 1,560 square meters of gym floor space and 860 theatre-style bleacher seats for spectators accommodate a range of activities that include priority sporting events, convocation ceremonies and exams.

The original gym lighting system is comprised of indirect 400-watt metal halides lamps designed to minimize glare for athletes during sports tournaments and events. while providing one of the finest sports facilities in the province, an opportunity existed to consider ways to conserve energy consumption outside of its primary sports-use, while enhancing lighting and sound conditions for other uses including exam writing.

The Okanagan Sustainability Office worked with Facilities management and FortisBC to determine the energy savings potential and return on investment to install a supplementary energy efficient lighting option in the gymnasium. 77 new high-efficient T5 fixtures were mounted underneath the existing indirect lighting system to provide brighter lights, reduced noise and reduced power consumption when the facility is not being used by athletes. The original metal halide lights are only turned on during sports tournaments when indirect lighting is needed. FortisBC awarded UBC a $19,000 rebate, and the new system will save the campus over 234,000 kwh per year and over $12,000 electricity costs per year. Facilities management has subsequently completed additional lighting retrofits across the campus in 2012, which will save the campus 196,000 kwh annually.

ConsErvation PHilosoPHY & PraCtiCEs

greening YOur ride

in 2012 an additional 15 secure bicycle storage units were added on campus to support commuting by bicycle and an additional showering facility was installed in the Administration Building. UBCycles at UBC's Okanagan campus offers short-term and long-term loans, workshops for a variety of skill levels, and tools for bike repairs. Commuters may store their bicycles in the UBCycles room and have access to day-use lockers, showers, and tools. Six electric vehicle charging stations are available on campus.

greening YOur OFFice

95 per cent of servers at UBC's Okanagan campus have been virtualized, translating to significant energy savings. in the past physical servers constantly consumed power, while running at very low utilization capacity. virtualization dramatically improves the utilization capacity of a single server, resulting in fewer physical servers for the same workload and lower power consumption overall. 100 per cent of computers and devices such as printers, copiers and fax machines have auto sleep settings applied and computers are replaced with energY STAr models during regular upgrades. iT Services has an ongoing program to replace 120v switches with 240v switches achieving 14 per cent power reduction per switch and reducing associated heat generation. All lab computers are set to automatically shut-off between 12 a.m. and 7 a.m.

greening YOur acTiOns

"Your waste, Your responsibility" was launched by Facilities management in 2012 to encourage the responsibility of building occupants for emptying their own recycling and waste receptacles through the provision of large receptacles for recycled material and small containers for garbage. Small yellow composting bins have been placed in office and lunch-room areas around the campus, and with continued education efforts it is anticipated the collection of campus organic waste will continue to grow. The campus composts an average of 40,000 kg of pre-consumer organic waste annually. The high-quality compost is used to enhance soil quality on the grounds.

Allan king, manager, maintenance and grounds.

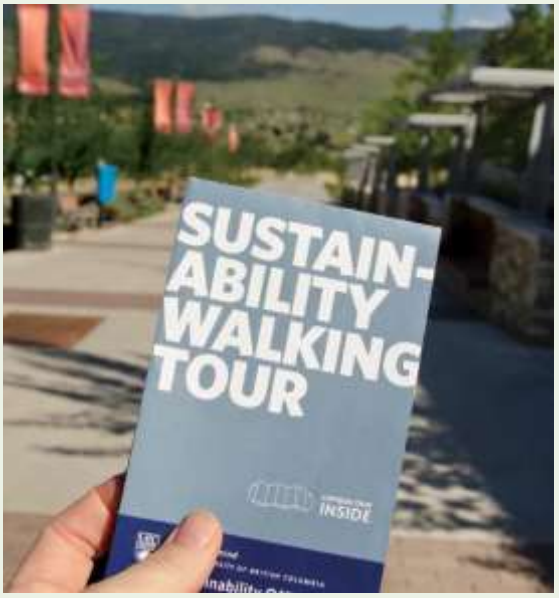
FeaTure campus engagemenT prOjecT

walk with us: campus sustainability Tour

The Campus Sustainability Tour was implemented by the Okanagan Sustainability Office to educate campus users about sustainable features of the campus. The tours support and engage the campus in sustainability learning, practice and leadership development, and demonstrate how higher education can serve as a learning space for sustainability.

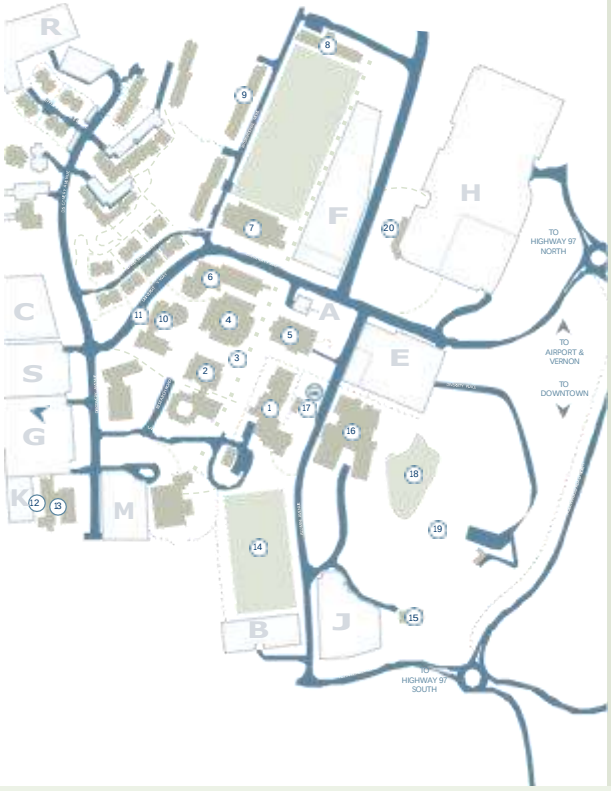
Since 2010, the tours have engaged more than 250 individuals, including staff, faculty and students, 129 local high school students, 20 international students, civic officials and members of the public.

Tours are tailored to community interests and regularly invite the participation of Facilities management to provide composting and district energy system tours. in response to growing demand, the Office has developed a "self-guided tour" and will continue to provide customized tours in collaboration with interested campus stakeholders and share relevant information for broad dissemination by others.



SuStainability Walking tour

UBC's Okanagan campus has been built from the ground up with sustainability in mind. We present the following points of interest as you walk around our beautiful campus. Follow the numbers and read as you go.



1 AdministrAtion

This is the administrative hub of the campus. All kitchens including the 'Sunshine Café participate in the campus' composting program. See back of brochure for more details.

60% of the fruit and 50% of vegetables used in campus kitchens are sourced locally.

2 Arts

Features an enclosed atrium with banana trees —a popular, peaceful space for study and quiet contemplation.

3 CourtyArd

Located between the Arts building and Science building is a living statue. It's called 'Decomposition' and was created by Byron Johnston, associate professor of visual arts. Erected in 2010, this artwork has composting from cafeteria, term papers, lichens, peat moss and more. It also features a telescope.

4 sCienCe

In the main foyer, you'll find the first prototype of a campus WaterFillz kiosk. These kiosks are now located in all academic buildings on campus, providing filtered water for refilling personal water bottles.

Recycling Station: In 2010, a campus-wide recycling program was implemented which includes paper, plastic, refundables such as pop cans, e-waste, Styrofoam, batteries, lab plastics, glass, and garden waste. Recycling stations are located in each building. Further details on back of brochure.

5 LibrAry

Remodelled in 2012, the Library building provides a great range of services and spaces that enhance the learning experience on campus. The Sustainability Office, Facilities Management, Postnet, the Bookstore, and the Library are partners in the Rescued Paper Scratch Pad program. Further details on back of brochure.

6 ChArLes e. Fipke Centre For innovAtive reseArCh

Completed in 2008, this 6,923 sq m building was the first in Canada to be awarded five Green Globes —the highest achievement for environmental and energy performance, and equivalent to LEED® Platinum.

Paired with the Arts & Sciences II building, they are the first campus buildings in the world to each receive five Green Globes and also the first paired buildings to attain this distinction.

This is also the first facility on campus to use an open loop geo-exchange groundwater energy system for heating and cooling.

7 university Centre

This 7,408 sq m building was completed in 2009, and is built to LEED® Gold standard.

WaterFillz Kiosk: Each academic building on campus has a WaterFillz kiosk which provides fresh, free, filtered water to students, faculty and staff who fill their own bottles. Each kiosk tracks the number of plastic bottles diverted from the landfill.

Installation of all kiosks was made possible by a partnership between the Sustainability Office, Facilities Management, and UBC Students' Union Okanagan.

8 purCeLL student residenCe

Occupied in 2011, Purcell has the following sustainable features: a green roof, solar panels for domestic hot water preheat and space-heating demands, in connection with its own closed loop geo-thermal exchange.

9 niCoLA student residenCe

This is the largest residence on campus at 10,768 sq m. The solar panel on its roof is used for domestic hot water preheat.

10 Arts & sCienCes ii

This 8,139 sq m building was completed in 2010, receiving the prestigious award of five Green Globes —the highest achievement for environmental and energy performance, and equivalent to LEED® Platinum.

Paired with the Charles E. Fipke Centre for Innovative Research, they are the first campus buildings in the world to each receive five Green Globes and also the first paired buildings to attain this distinction.

11 bio-swALe

This is an urban landform used to convey surface water —enhancing infiltration and reducing surface runoff. Bio-swales are typically moderate gradient devices (approximately one to 5% in channel slope) and may be covered by grasses, landscape fabric, mulch or other vegetation or leaf litter.

12 hunter wireLess irrigAtion system

Smart irrigation is utilized across the campus and minimizes unnecessary watering. The Hunter IMMS 2.0 irrigation management monitoring system automatically adjusts or ceases watering times on low temperature (3 degrees Celsius), precipitation (1/8 to 1 inch) or if wind speed is greater than 20 km/hour.

The main computer monitoring control is located in EME and a small weather station is located near RHSC which measures sunlight, rain, and wind speed.

13 reiChwALd heALth sCienCes Centre (rhsC)

This is the home of UBC's Southern Medical Program. The 5,104 sq m building was completed in 2012 and is built to LEED® Gold equivalent standards. It has the largest green roof on campus which has integrated indigenous plants and vegetation. A green roof keeps the building cool in the summer and warm in the winter, as well as absorbing rain water and improving air quality.

Water consumption is anticipated to be reduced by nearly 40% compared to a typical building. As a result of its energy efficient design, the RHSC anticipates approximately 285 fewer tonnes of greenhouse gas (CO_2e) than a typical building of the same size.

75% of construction waste material was diverted from the landfill.

14 nonis sports FieLd

This 153-by-75m artificial turf field consists of a permeated plastic carpet with plastic grass blades (no mowing and no watering). The field also features a heat-reflecting surface layer of crumb rubber. It meets international standards for soccer, Canadian football, field hockey, and field lacrosse. It has dramatically extended the playing season for university and community users, replacing a natural grass surface that was closed from the end of October through April.

15 Composting stAtion

Tours must be pre-arranged for this working facility. The Composting Station, which uses two Composting Earth Tubs, diverts over 3,000 lbs of waste from the landfill every month. This system provides highly enriched mulch material for campus ground maintenance.

16 engineering, mAnAgement And eduCAtion (eme)

Home to four faculties and schools, this is the largest building on campus at 16,769 sq m. Completed in 2012, it has a green roof and is targeted to achieve five out of five points for LEED® Innovation in Design for clear-water utilization, education, green housekeeping, and green power.

Of the 5,415 sq m of non-assignable space, 1,000 sq m is devoted to environmental and social sustainability and 800 sq m is used to house the heat exchange recovery equipment.

The use of low-flow fixtures will provide an anticipated 40% savings over conventional systems.

The energy savings correspond to an anticipated 46% total cost savings at current utility rates.

17 trAnsportAtion stAtion

The Universal Bus Pass (U-Pass) Program —a partnership between UBC Okanagan campus, BC Transit, City of Kelowna and the Regional District of Central Okanagan —provides students with a low-cost, sustainable transportation option. Other important features and transportation initiatives include:

- Bus shelters have low-energy solar-powered lighting.
- Sheltered bike racks and end-of-trip facilities for cyclists.
- Preferred parking for carpoolers.
- Parking stalls for electric cars/charging stations (6).

18 retention pond

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

19 LeArning gArden

A model campus garden dedicated to promoting the principles of sustainable environmental practice, responsible stewardship of nature, interdisciplinary learning and knowledge.

20 geo-thermAL exChAnge

The geo-thermal district energy system (DES) is used to heat and cool campus buildings. This closed-loop system will reduce natural gas consumption and the campus carbon footprint.

aCtions toWarDs Carbon nEutralitY

The actions listed below contribute to a reduction in greenhouse gas emissions from sources for which public sector organizations are responsible under the carbon neutral government regulation of the greenhouse gas reduction Targets Act.

acTiOn	sTaTus	sTeps Taken
mobile Fuel combustion (Fleet and other)		
behaviour change program		
Provide fleet driver training to reduce fuel use	ongoing / in Progress	100% of all new driving employees are trained.
introduce anti-idling policy and / or raise anti-idling awareness for fleet drivers (e.g., signs, stickers, messages)	ongoing / in Progress	ongoing communication to support anti-idling practice. signage in place.
Encourage carpooling in fleet vehicles	ongoing / in Progress	Continued promotion and encouragement to minimize the number of trips into town for purchase or send one person to get all items.
Promote alternatives to fleet vehicle travel where possible (e.g., bicycles, public transit, walking)	ongoing / in Progress	included in anti-idling practice. Continue promoting no use of golf carts in the courtyard between 8 a.m. – 4 p.m..
other Mobile Fuel Combustion actions		
Provide electric charging stations for commuters	ongoing / in Progress	6 stations available on campus
vehicle fuel efficiency		
replace vehicles with more fuel-efficient models	ongoing / in Progress	1 gas golf cart replaced with electric. 4 remaining gas golf carts of a fleet of 17.
replace larger vehicles with smaller models according to fleet "right- sizing" principles	ongoing / in Progress	as existing vehicles are retired they will be replaced with high efficient and / or hybrid vehicles.
Perform regular fleet maintenance to improve fuel-efficiency	ongoing / in Progress	all vehicles are regularly maintained.

sTeps planned	sTarT Year	end Year
Continue driver training for new employees. Continuation of mandated pre-trip inspections for fleet vehicles (internal Facilities practice).	2010	no End Date (Continuous)
Continue discussions regarding anti-idling with Post secondary transit Committee to support anti-idling practice.	2009	no End Date (Continuous)
Considering measures to eliminate need for fleet vehicles to collect items. looking at strategies to reduce on/off campus travel. i.e. Purchase through Central stores. Continue to promote under anti-idling practice.	2009	no End Date (Continuous)
Continue to promote walking where possible.	2009	no End Date (Continuous)
Promote and educate community on availability of electric vehicle (Ev) stations.	2011	no End Date (Continuous)
as existing vehicles are retired they will be replaced with electric or fuel efficient vehicles as appropriate. Plan to replace 2 more gas golf carts with electric in 2013.	2008	no End Date (Continuous)
as existing vehicles are retired they will be replaced with high efficient and/or hybrid vehicles. size will be considered and a purchasing factor balanced according to vehicles use.	2008	no End Date (Continuous)
Continue regular maintenance of all fleet vehicles.	2008	no End Date (Continuous)

aCtions toWarDs Carbon nEutralitY

acTiOn	sTaTus	sTeps Taken
stationary Fuel combustion, electricity		
behaviour change program		
Help staff reduce personal energy use through "workstation tune-ups"	ongoing / in Progress	updates to website to build awareness of energy saving behaviours. Communication through shift publication. Continuation of it services Evergreen Program for computer and laptop replacement.
ask staff to unplug electrical equipment or switch off power bars when not in use	ongoing / in Progress	updates to website to build awareness of energy saving behaviours. Communication through shift publication.
ask staff to close blinds at end of work day to reduce heating / cooling demands	ongoing / in Progress	as above.
Encourage staff to use air dry setting on dishwashers	ongoing / in Progress	as above.
Provide tips to staff on saving energy in the office while working outside of regular business hours	ongoing / in Progress	as above.
Encourage use of stairs instead of elevators	ongoing / in Progress	as above.
Provide reminders for turning off lights (e.g., signs, stickers, messages)	ongoing / in Progress	as above.
Promote hot water conservation	ongoing / in Progress	as above.
it power management		
install power management software which shuts down computers outside of regular business hours	ongoing / in Progress	98% of faculty have laptops and lab research desktop computer numbers continue to increase. all computer labs' computers are set to automatically shut-off between 12 a.m. and 7 a.m. (Mac computers are set to sleep).
implement server virtualization	ongoing / in Progress	95% of servers have been virtualized since start year indicated. Have reduced servers to 4 from 6. the virtual desktop program is on hold.

sTeps planned	sTarT Year	end Year
Continue education, promotion, and encouragement of sustainable behaviours and practices. Focused behaviour change strategy for active energy reduction amongst staff and faculty planned for 2013- 2015 (the Power of You). Pulse Energy Dashboard available publicly for building occupants to monitor consumption and engage in behaviour change. FortisbC active partner.	2009	no End Date (Continuous)
Measure phantom load and begin communication efforts to reduce it. Determine barriers to behaviour change through surveys within energy engagement strategy (Power of You). Provide support to reduce barriers. E.g. accessible power bars for ease of shutdown overnight.	2009	no End Date (Continuous)
Focused program of behaviour based change toward energy reduction targets 2013-2015 (Power of You). support green teams to provide outreach to building occupants.	2009	no End Date (Continuous)
as above.	2009	no End Date (Continuous)
as above.	2009	no End Date (Continuous)
as above.	2009	no End Date (Continuous)
as above.	2009	no End Date (Continuous)
as above.	2009	no End Date (Continuous)
regular replacement program 3 years for laptops and 4 years for desktops. up to 2/3 reduction in power consumption for replacement units. it is actively measuring power consumption of various workstations to continue optimizing.	2005	no End Date (Continuous)
Completing additional 25% virtualization of the phone system; all phone servers that can be virtualized will be converted within the next year. over the next 3 years, there will be a reduction of the number of physical servers by providing low to no cost virtual server options to researchers. Pilot projects include a virtual desktop for use in labs.	2007	no End Date (Continuous)

aCtions toWarDs Carbon nEutralitY

acTiOn	sTaTus	sTeps Taken
apply auto-sleep settings on computer monitors and CPus	ongoing / in Progress	100% of computers have auto-sleep settings applied.
remove stand-alone printers, copiers, and / or fax machines and install multi-function devices as part of a print management strategy	ongoing / in Progress	Continuous reassessment within space planning function.
apply auto-sleep settings on printers, fax machines, and / or multi- function devices	ongoing / in Progress	100% of devices auto-sleep settings applied
replace computers with EnErgY star models during regular computer upgrades	ongoing / in Progress	Complete
other Stationary Fuel Combustion		
recover waste heat from data centres	ongoing / in Progress	administration building data centre tied to geo-x District Energy loop (DEs). library data centre tie-in has been estimated at $100,000. EME data centre was tied-in during build out and is working.
Changing switches in 40 communication rooms	ongoing / in Progress	120 v switches replaced with 240 v switches, 14% power consumption reduction per switch and reduced heat generation.
building optimization Plan	ongoing / in Progress	Development of agreement with FortisbC for building optimization Plan. Consulting firm retained.
owned buildings		
Establish energy performance baseline for owned buildings	ongoing / in Progress	baseline is adaptive as improvements are undertaken and as geo-x District Energy loop (DEs) is optimized. 2012 was the first full year of operation with a closed DEs.
register for performance labelling / certification for operations and maintenance of owned buildings (e.g., lEED Eb:o&M)	ongoing / in Progress	buildings were completed and occupied and final commissioning is underway for EME. started lEED certification process for rHCs and EME.
achieve lEED nC gold certification at a minimum for new construction or major renovations	ongoing / in Progress	all new academic buildings are built to lEED gold standard or equivalent. all new residential buildings are built to ubC rEaP building standards.

sTeps planned	sTarT Year	end Year
Continue to educate users to leave sleep setting on through implementation of campus wide behaviour change energy engagement strategy (Power of You).	2005	no End Date (Continuous)
Continuous reassessment within space planning function.	2008	no End Date (Continuous)
Continue to ensure devices are set to auto-sleep.	2005	no End Date (Continuous)
Continue to ensure all computers are EnErgY star rated.	2005	no End Date (Continuous)
look for further opportunities to tie data centres to DEs.	2011	no End Date (Continuous)
Continue to upgrade switches.	2012	2014
in partnership with FortisbC ubC okanagan is implementing a program to monitor energy consumption and implement physical retrofits to reduce consumption. building occupants will be encouraged to reduce energy consumption through a focused behaviour change program (Power of You).	2012	no End Date (Continuous)
Continuation of campus-wide energy monitoring through sMarttool reporting. Energy Monitoring in real time through the Pulse Energy Dashboard in nine academic buildings.	2010	no End Date (Continuous)
all residences built to rEaP gold standard. all new academic buildings are built to lEED gold standard. in process to achieve lEED gold certification for Engineering / Management / Education building and reichwald Health sciences Centre.	2008	no End Date (Continuous)
as mandated, all new academic buildings are built to lEED gold standard or equivalent and all new residential buildings are built to ubC rEaP building standards. in process to achieve lEED gold certification for Engineering / Management / Education building and Health sciences Centre.	2008	no End Date (Continuous)

aCtions toWarDs Carbon nEutralitY

acTiOn	sTaTus	sTeps Taken
Perform energy retrofits on existing, owned buildings	ongoing / in Progress	Completed a feasibility study to identify Carbon reduction Measures and paybacks. With FortisbC, set up agreement for a building optimization Plan to monitor baseline consumption and identify energy savings projects.
incorporate a refrigerant management strategy into regular building management / maintenance to reduce fugitive emissions	ongoing / in Progress	Continuation of reported refrigerant top-ups by service provider. ubC monitors service tags and maintains service records of equipment and reports in-scope emissions. usage has increased and now exceeds the reporting threshold.
planning / management		
reduce office space (square meters) per employee	ongoing / in Progress	
install a real time metering system (e.g. Pulse, reliable Controls, Houle Controls)	ongoing / in Progress	Pulse Energy Dashboard real time metering installed for nine academic buildings. Measures and publicly displays energy consumption volume and type (electricity, natural gas, hot water, and DEs).
retrofit details for owned buildings		
upgrade mechanical systems (heating, cooling, ventilation) during retrofits	ongoing / in Progress	ongoing retrofits for HvaC and occupancy sensor controls completed on all laboratories and theatres in all existing buildings.
upgrade lighting systems during retrofits	ongoing / in Progress	Completed retrofit conversion from t-12 to t-8 campus wide. additional 3,600 t-12 ballasts changed to t-8 on campus in 2012; direct rebate applied to purchase cost. retrofit saves campus 196,000 kWh / yr.
upgrade / adjust control systems during retrofits	ongoing / in Progress	installed solar powered signage lighting on all academic buildings.
improve building insulation (including windows) during retrofits	ongoing / in Progress	replaced blinds in arts building on second floor, blocking uv light and insulating rooms.
supplies (paper)		
behaviour change program		
train staff to use collaborative software for electronic editing (e.g. sharePoint, groove, etc.)	ongoing / in Progress	a campus wide shared drive is available for access by all departments.
Encourage staff to hold paperless meetings or presentations (i.e., no handouts)	ongoing / in Progress	the addition of smart boards and increased use of laptops are reducing paper consumption.

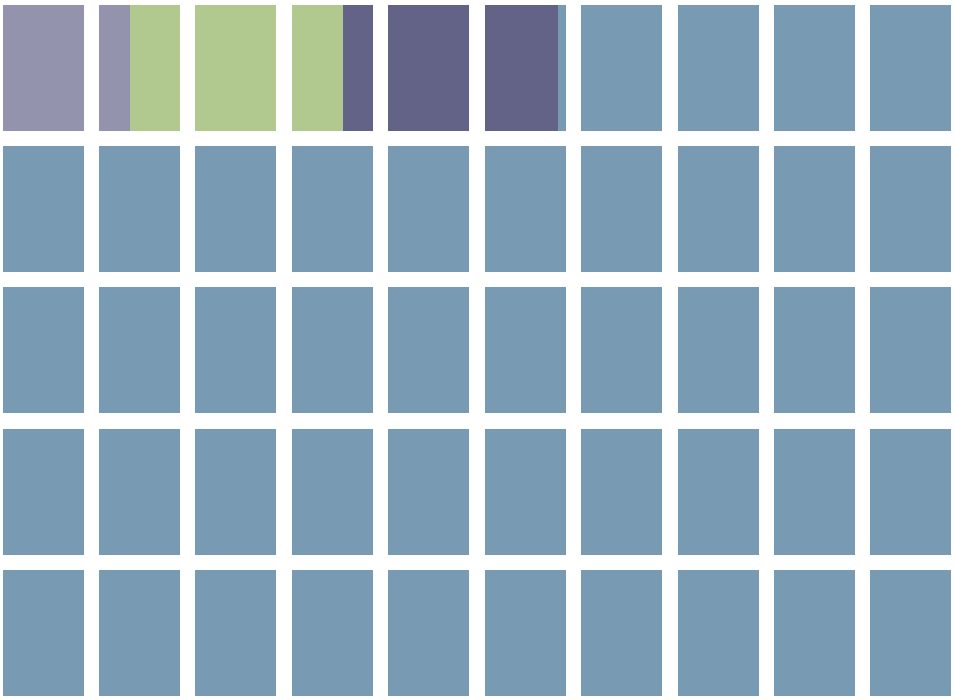
sTeps planned	sTarT Year	end Year
Work towards optimization of the geothermal system and energy reduction strategies in all existing owned buildings. implement building optimization Program and associated retrofits.	2008	no End Date (Continuous)
increase maintenance and plan a design review. Plans are underway to determine root cause and address maintenance issues / upgrades as budget allows. Continue to monitor and report emissions.	2008	no End Date (Continuous)
Moving towards reconfiguring and reducing space to align with space standards. space intensification to begin in 2013. infrastructure Development – Facilities Planning report available online: http://provost.ok.ubc.ca/_shared/assets/facstudy32094.pdf.	2008	no End Date (Continuous)
Developing baseline energy consumption. Working with a consulting firm to identify and prioritize energy reduction projects, implementing physical retrofits and establishing a two year behaviour based change strategy (Power of You).	2012	no End Date (Continuous)
the building optimization Program in partnership with FortisbC, will identify further cost recovery retrofits for consideration.	2009	no End Date (Continuous)
the building optimization Program will identify further cost recovery retrofits for consideration.	2009	no End Date (Continuous)
the building optimization Program will identify further cost recovery retrofits for consideration.	2008	no End Date (Continuous)
Plans are in place to replace blinds in science building in 2013.	2009	no End Date (Continuous)
increase awareness through education to promote use of shared drives.	2010	no End Date (Continuous)
Continue to promote paperless offices through behaviour change program.	2008	no End Date (Continuous)

aCtions toWarDs Carbon nEutralitY

acTiOn	sTaTus	sTeps Taken
electronic media in place of paper		
install collaborative software for electronic editing (e.g. sharePoint, groove, etc.)	ongoing / in Progress	100 % complete.
use electronic document library for filing common documents	ongoing / in Progress	Complete. a campus wide shared drive is available for access by all departments.
switch to an electronic payroll notification system in place of paper pay stubs	Completed (in Previous Year)	
other paper Supplies actions		
look at new opportunities to pool inventory sharing i.e. paper and general office supplies	in Development	in development
Paperless office	ongoing / in Progress	several offices are striving to develop paperless office practices and strategies.
give access to view printing numbers.	in Development	in development
paper type		
Purchase 30% post-consumer recycled paper	ongoing / in Progress	in 2012, 97% of purchases through official supplier unisource contained 30% post-consumer recycled content or better. When direct purchases through grand & toy, staples, and xgs are included, 82% of total university paper purchases contain 30% post- consumer recycled content or better. selected new official paper supplier (grand & toy) and negotiated better pricing for 50% PCr paper (to be cheaper than previously offered 30% PCr paper with previous supplier). ubC's okanagan campus developed a custom ubC site for ordering that highlights 30%, 50% & 100% PCr paper options. virgin paper eliminated as an option on the custom site and is priced more expensive than 30- 100% PCr paper.
printer / document settings		
switch networked printers and photocopiers to automatic double-sided	ongoing / in Progress	10% of network printers or photocopiers are set to automatic double- sided. automatic double-sided printing option pre-set on lab printers. 10% of ubC okanagan fleet are located in laboratories.

sTeps planned	sTarT Year	end Year
increase awareness through education to promote use of shared drives.	2008	no End Date (Continuous)
increase awareness through education to promote use of shared drives.	2008	no End Date (Continuous)
		no End Date (Continuous)
Continue	2012	no End Date (Continuous)
Continue to promote paperless offices through behaviour change program.	2010	no End Date (Continuous)
Continue to develop	2011	no End Date (Continuous)
grand & toy will also be adding the option of wheat paper to our custom list as a tree free paper alternative. Continue to promote 50% post-consumer recycled content paper.	2008	no End Date (Continuous)
track duplex printing usage and increase awareness through behaviour change and user education programs to promote use of double sided printing on all faculty and staff computers.	2009	no End Date (Continuous)

grEEnHousE gas EMissions bY sourCE For tHE 2012 CalEnDar YEar (tCo_2e*)



The following greenhouse gas emissions have been quantified using the BC provincial government's SmART tool reporting Framework.

1.4% 45.4	mobile (fleet and other mobile equipment)
2.2% 72.6	Fugitive (refrigerants)
2.3% 75.5	Supplies (paper)
94.2% 3,123.5	Stationary (Building Heating and generators) and electricity

total eMiSSionS: 3,317

OFFseTs applied TO BecOme carBOn neuTral in 2012

Total offsets required: 3,316. emissions which do not require offsets: 1. **

* Tonnes of carbon dioxide equivalent (tCO2e) is a standard unit of measure in which all types of greenhouse gases are expressed based on their global warming potential relative to carbon dioxide.

** Under the Carbon neutral government regulation of the greenhouse gas reduction Targets Act, all emissions from the sources listed above must be reported. As outlined in the regulation, some emissions do not require offsets.


electric
PARK

2012 carBOn neuTral acTiOn Overview repOrT

FOr UBC's Okanagan campus

a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA