a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA
Sustainability Office
Okanagan Campus

OKANAGAN
SUSTAINABILITY
INSTITUTE

Joint Academic and Operations Sustainability Report Submission

2010-2012

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Introduction

Sustainability at UBC's Okanagan campus is multi-faceted and rapidly evolving. Sustainability research and teaching are conducted in faculties and their departments, in research centres and institutes, and in Campus as Living Lab initiatives. Sustainability is embedded into campus operations carried out by staff across the Okanagan campus, with unit-level activities, reporting of performance and coordination of performance data supported and enabled by the Okanagan Sustainability Office. Any joint academic and operations reporting on richly diverse and highly distributed sustainability activities is inevitably incomplete. This report captures the inter-faculty, interdisciplinary research activities of the Okanagan Sustainability Institute, Campus as Living Lab pilot projects where academic and operational interests are in synergy, and operational sustainability activities reported under the mandate of the Okanagan Sustainability Office.

Section 1.0 reports the progress of the Okanagan Sustainability Institute (OSI), an interdisciplinary and inter-faculty research unit focused on issues at the intersection of water, urbanization, and rurality.

Section 2.0 summarizes Okanagan campus collaboration between academic and operations contributors piloting the Campus as Living Lab vision in a set of Okanagan campus projects.

Section 3.0 provides the Okanagan Sustainability Office's Operational Sustainability Report, which summarizes selected campus operational sustainability activities, accomplishments and awards.

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Section 1.0 Okanagan Sustainability Institute

1.1 Okanagan Sustainability Institute: Identity, Mandate, Mission and Operational Approach

1.1.1 Identity

The Okanagan Sustainability Institute is a research-focused, partnership-based and externally supported academic unit of UBC. The OSI was founded in December 2006 and is an academic unit of the Okanagan campus operating under the governance requirements of policy O-5. While we are physically located on the Okanagan campus, we are capable of collaborating closely with Vancouver campus sustainability-focused researchers, including sibling institutes and centres: the Centre for Integrated Research on Sustainability, the ISIS Centre for Climate Change Research, and the Centre for Sport and Sustainability.

1.1.2 Mandate

Our mandate is to enable inter-faculty, collaborative, interdisciplinary sustainability research. Early activities of the OSI 2006-2011 were largely organizational, led by a series of acting directors. There is no record of research projects being funded or brought to completion, while it should be noted that successful non-OSI research projects emerged as a result of OSI-sponsored discussions. The appointment of the first 5-year term director in July 2011 provided continuity of leadership enabling launch of a self-study followed by initiation of research activities working from our strengths and community.

As an inter-faculty institute, the OSI enacts its mandate as a horizontal coordinator across the largely vertical 'silo' structures of departments, schools and faculties. The OSI's principal sustainability-encouraging capacity lies in its convening power: the OSI enables discussions leading to co-definition of problems, formation of partnerships, identification of resources, and conduct of research.

As a horizontal coordinator mandated to enable research, the OSI is best understood as a set of practices and overlapping interests. The Director is a Professor in a member faculty, with a portion of his workload devoted to administration of the OSI. The growth of the OSI will be supported by five senior hires identified as 'sustainability positions.' These professors will serve as liaisons between member faculties and the OSI, while participating in the OSI from their positions in member faculties. Faculty are not presently appointed directly to the OSI, and as a research institute the OSI does not offer undergraduate or graduate programming.

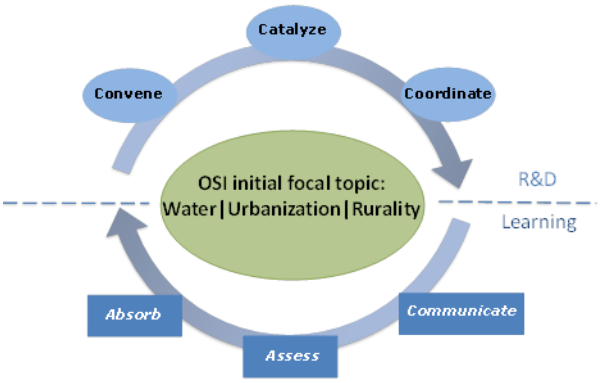
1.1.3 Mission and Operational Approach

Our main initial focus is on questions at the intersection of water, urbanization, and rurality, in the Okanagan valley and comparable regions.

Engaging questions raised by researchers or community partners, we seek to convene researchers and partners, catalyze their interaction on a project basis, and coordinate their efforts. We additionally seek to promote the development of the OSI and our community as a learning organization, seeking to communicate results within and beyond the academy, assessing our progress as catalysts of R&D, and

embedding lessons learned. In all we do, we try to engage with Okanagan communities, and as we face research opportunities and questions in the valley, we try to generate transferable, scalable results giving rise to first-rate academic publications. These functions of the OSI constitute a cycle of actions we aim to operate at the highest possible speed, consistent with our dependence on external funding opportunities and external partners subject to contextual factors beyond our control.

Operational cycle diagram:



2.1 Enacting our Operational Approach: OSI Working Groups and Activity Highlights

The OSI's approach to community-engaged sustainability research is carried out in Working Groups. Working Groups are led by a UBC faculty member and co-chaired by the OSI director, and may include UBC faculty and staff, industry, government, and other community members. Working Groups are constituted as interest arises in a particular topic related to the intersection of water, urbanization and rurality, and provide a forum for discussion and growth of mutual understanding prior to response to R&D opportunities. Each working group offers a meeting point for researchers from across campus and an initial 'no wrong door' contact option for researchers and community members concerned with research in a given area.

Close relations between Working Groups and potential and ongoing partners are further fostered by outreach, and what we call 'reverse seminars.' Working Groups have presented interests and progress to the City of Penticton, Peachland Arts Council and others, and in our 'reverse seminars' we bring partners to campus to tell us how they see sustainability partners in their worlds – from the Cascadia Green Building Council to the SFU Community Trust to current partner New Monaco Enterprises. As the various kinds of conversations we foster raise new opportunities, we anticipate that some existing Working Groups will take different forms, and new Working Groups will be formed. We are, for example, in the process of considering formation of a Sustainability Curriculum Working Group focused on development of sustainability curriculum from K-12 and beyond.

2.1.1 Water and Urbanization Working Group

Co-Chaired by Dr. John Janmaat, (LEEF) BC Regional Innovation Chair in Water Resources and Ecosystem Sustainability, this group involves community members from organizations including the Okanagan Basin Water Board, Archineers, Urban Systems, EnCircle, and New Monaco. This Working Group is currently working with Don Degen, City of Kelowna Utilities Manager, to co-define collaborative R&D regarding understanding of demand for water, and civil infrastructure management with particular regard for water infrastructure. Members of this Working Group are also working in Peachland with developer New Monaco Enterprise and partners District Municipality of Peachland, Urban Systems, Aplin & Martin engineers, and Fortis BC. We are working to develop innovative energy and water system options at neighbourhood scale for the new development of New Monaco and Peachland, with implications for similar new and retrofit neighbourhood developments elsewhere.

2.1.2 Life Cycle Analysis Working Group

This bi-campus Working Group is co-led with Alberto Cayuela of the Vancouver campus Centre for Interactive Research in Sustainability. The Working Group has conducted a Life Cycle Analysis of the Vancouver campus bioenergy facility, and is currently in the first phase of a multi-phase R&D relationship with Haworth, provider of movable wall and raised floor systems to the Centre for Interactive Research in Sustainability. Led in the Okanagan by Dr. Kasun Hewage of Engineering, and in Vancouver by Dr. James Tansey of the Sauder School, the Working Group is conducting a life cycle analysis of Haworth recyclable building material technology, together with market analysis and study of user perceptions of the building material technology when installed at the Centre for Interactive Research on Sustainability.

2.1.3 Okanagan Aesthetic Working Group

Co-chair by Prof. Nancy Holmes of the Faculty of Creative and Critical Studies, the Working Group is responding to academic and community interest in the conjunction of aesthetic values and sustainability concerns. Members of the Group are blending insights from Creative and Critical Studies with methods from human geography to engage publics regarding aesthetic values in the built environment, aiming to provide thoughtfully-conceived, publicly supported design guidelines to developers. As part of the Working Group's efforts to understand the relation between urbanization and rurality, and to witness and communicate that changing relation, Prof. Denise Kenney is collaborating with New Monaco Enterprises to install time-lapse cameras on the New Monaco property in Peachland to witness the state of the site from old orchard and rocky bluffs to multi-use development, capturing images in all four seasons, to be developed into film presentation for public dissemination.

2.1.4 Green Roof Working Group

Co-chaired by Dr. Rehan Sadiq of Engineering, this group is active in experimentation, community outreach, and use of campus as a living lab. A set of ten experimental green roofs is located beside the Engineering, Management and Education buildings, where researchers from Engineering and Biology are working with private sector partner EnCircle Design Build to investigate the quality of water running off

a range of roof types. In September 2012 these experimental roofs were part of a tour and seminar held with forty seven members of the Urban Development Institute's Okanagan chapter. Our visitors heard research perspectives from UBC and Okanagan College faculty and operations staff, and visited our experimental roofs and operational, commercial-scale roofs on campus buildings. Okanagan campus buildings and their green roofs are now part of the focus of the Green Roof Working Group, as Engineering graduate students are measuring the energetic and environmental performance of these roofs as we seek to understand longer-term performance of green roofs.

Section 2.0 Campus as a Living Lab

2.1 Governance and Key Collaborators

The Okanagan campus has renewed its participation in the Campus as Living Lab initiative in progress on the Vancouver campus. This initiative seeks opportunities for synergies between operations, research and teaching and demonstration in sustainability and beyond. Seeing an opportunity for the Okanagan campus to find collaborative synergies with the Vancouver campus while developing Okanagan-appropriate adapted priorities and practices, Keith Culver, OSI director, has joined the system-wide Campus as Living Lab Steering Committee. Roger Bizzotto, Director, Facilities Management and Leanne Bilodeau, Director Sustainability Operations, Okanagan Sustainability Office have joined the system-wide Campus as a Living Lab Working Committee. Culver is also chairing an Okanagan Campus as Living Lab ad hoc Committee together with Bizzotto and Bilodeau, charged with identifying an appropriate longer-term administrative structure, and initiating pilot projects demonstrating the feasibility of Okanagan campus participation in the Campus as Living Lab initiative.

2.2 Campus as a Living Lab Pilot Projects

Four pilot projects were initiated early 2013, enabling the ad hoc Committee to develop an operating process while participating faculty, staff and community members build understanding of what Campus as Living lab can mean in the Okanagan context. As is to be expected, there has been substantial overlap between OSI members and Campus as Living Lab projects, creating a previously largely unrealized synergy between research, operations and teaching. The focus of completed and ongoing Campus as a Living Lab projects includes green roof performance, ecological landscaping and campus water systems.

2.2.1. Green Roof Performance

Bridging the OSI's Green Roof Working Group and Campus as Living Lab, an Engineering graduate student is assessing the energetic and environmental performance of existing operational green roofs on campus.

2.2.2. Fitness and Wellness Centre Landscaping

Faculty, staff and a community representative of the Okanagan Xeriscape Association have collaborated with Facilities Management, the Okanagan Sustainability Office, and UBC's Architecture Team to identify options for plantings representing Okanagan ecosystems. Collaboratively identified planting options will enable easier maintenance, better ecological and aesthetic functioning of the site and use of the site for demonstration purposes assisting teaching.

2.2.3. Campus Water Systems

Collaborative opportunities are being explored between Faculty members from Engineering and staff from Facilities Management and the Okanagan Sustainability Office regarding the infrastructure and operation of the campus water system. While Facilities Management has implemented measures toward improved water quality, work with consultants continues to devise new solutions and to create future research opportunities, where viable.

Section 3.0 Operational Sustainability Report

3.1 Context

The Okanagan Sustainability Office is part of the Associate Vice–President, Administration and Finance portfolio and is responsible for campus operational sustainability strategy, initiatives, advisory support, measurement and reporting toward the achievement of campus sustainability performance. Supporting UBC's Place and Promise sustainability commitments, the Office is a key collaborator with the Okanagan Sustainability Institute in the Campus as a Living Laboratory Initiative.

This report provides an overview of selected operational sustainability activities and achievements at the University of British Columbia Okanagan campus in the areas of climate and energy, green buildings, waste management, water management and campus engagement.

3.2 Climate and Energy

3.2.1 Greenhouse Gas Inventory (GHG) – Buildings, Fleet & Paper

Tracking, reporting and offsetting Scope 1 and 2 Greenhouse Gas Emissions for buildings, fleet and paper began in 2010, in compliance with provincial legislation.

Table 1 provides a breakdown of in-scope carbon emissions that have been reported and offset by the campus to become carbon neutral in operations. The inventory of Scope 1 and 2 carbon emissions demonstrates that the majority of campus carbon emissions derive from stationary fuel combustion (buildings) with 94% of emissions attributable to this source.

Table 1: Offsettable Emissions Since 2010

Offsettable Emissions areas (tCO2e)	2010	2011	2012
Buildings	2725.8	3135	3123.5
Paper	64.1	63	75.5
Fleet	60.8	39	44
*Fugitive	1.5 (<1%)	19.7 (<1%)	72.6 (>1%)
Total for offsets	2850.7	3237	3316 (incl. fugitive)

** Fugitive emissions less than 1% of total emissions are out of scope. In 2012 fugitive emissions exceeded 1% of total.*

3.2.2 Greenhouse Gas Inventory (GHG) – Buildings Only

Table 2 below compares absolute and relative building emissions to a 2007 baseline. From 2007 to 2012, UBC's Okanagan campus has increased its floor space by 95 percent with the addition of new academic buildings, seven new student residences and a geo-exchange controls building. The expanded space has accompanied an 81 percent increase in the number of student FTE's.

While the addition of thirteen facilities on campus and greater operational demands have increased absolute carbon emissions from 2007 by 43 percent, the campus achieved a 27 percent decrease in

emissions per square meter of building space and a 21 percent decrease in emissions per student FTE. The design of new campus facilities and the implementation of a low carbon heating and cooling district energy system have contributed to greater efficiencies. A significant amount of energy used to heat and cool buildings on campus comes from renewable sources.

Table 2: Building Emissions Compared to 2007 Baseline

Key Performance Indicator	2007	2012	Change from 2007 - 2012
GHG Emissions Buildings only (tonnes CO2e)	2,186	3,124	+43%
Floor Space (SQ M)	71,919	140,370	+95%
GHG Emissions per SQ M (tonnes CO2e/FTE)	0.0304	0.0223	-27%
Student enrollment FTE	4,087	7406	+81%
GHG Emissions per Student (tonnes CO2e/FTE)	0.535	0.422	-21%

** Trend data for fleet and paper unavailable prior to 2010*

3.3.3 Geo-Exchange District Energy System

The campus' 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 and is in the retro-commissioning phase of its development. The system provides energy sharing between buildings, heat re-capture from data rooms, thermal storage and flexibility for future fuel switching.

3.4 Green Buildings

3.4.1 Green Building Leadership and Awards

Progress has been made to integrate sustainability design, energy performance and resource conservation measures in new campus facilities. Five new academic buildings have been designed to LEED® Gold standard or equivalent, with the Reichwald Health Sciences Centre having achieved LEED Gold Certification in 2013. Seven new student residences have been completed, the majority of which are built to REAP Standard, UBC's green building rating system for residential buildings.

The campus has received significant recognition for its sustainability leadership. In 2012 the Arts and Sciences Centre and the Charles E. Fipke Centre for Innovative Research were recognized as the first campus buildings in the world to each receive five Green Globes Awards, the highest eco-rating level, as global leaders in energy and environmental performance design. In 2012 the Purcell student residence and the campus geo-exchange system were awarded Thompson Okanagan Commercial Building Awards for leadership in sustainable design within the region.

The campus achieved FortisBC's Conservation Excellence Award in 2012 for leadership in energy efficiency design of new construction for the Arts and Sciences Centre, the Engineering, Management & Education Building and the Reichwald Health Sciences Centre. Two of the buildings have installed green roofs, and all new buildings have integrated low flow water fixtures, occupancy sensors, and strategic design for passive heating and cooling. The gymnasium lighting upgrade project was recognized by FortisBC for leadership in energy conservation in 2012. Combined FortisBC awards from 2008 exceed $375,000 in rebates for 6,300,000 annual kilowatt hour savings and $375,000 annual utility savings.

Details on campus awards are provided in Section 3.10 of this report entitled External Recognition and Awards.

3.4.2 New Partnership for Energy Efficiency in Original Academic Buildings

In 2012, a three year Building Optimization Program agreement was struck with Fortis BC. Led by a collaborative working group involving the Okanagan Sustainability Office, Facilities Management and IT Services, the goal of the program is to optimize the performance of five original buildings on campus toward greater energy efficiency and carbon reductions. The program provides real-time energy monitoring of electricity and natural gas consumption as well as energy use for hot water heating and geothermal heating and cooling in nine academic buildings on campus. The original five academic buildings on campus are targeted for energy reduction measures through operational and technical retrofits. Retrofits will begin implementation in the fall of 2013, in tandem with the first phase of a Behavior-Change Energy Reduction Strategy, "The Power of You" developed to encourage voluntary energy reduction measures on the part of building occupants.

3.4.3 Green Building Operations and Practices

The campus has developed various operational programs and practices to increase efficiencies and reduce environmental impacts and associated costs. These include:

- Implementation of green housekeeping practices to Green Seal Standards
- A Lotus-Pro Pilot Program in the Reichwald Health Sciences Centre to assess the use of aqueous ozone as a cleaning agent reducing the use of chemical cleaning agents, associated packaging and transport emissions.
- A fleet anti-idling procedure was developed to reduce fuel consumption and associated emissions through regular fleet maintenance, fleet driver training and the promotion of carpooling and alternatives to fleet vehicle use on campus.

3.5 Waste Management

A campus-wide recycling program is established to divert waste from the landfill by recycling paper, plastic, refundables, e-waste, batteries, Styrofoam, lab plastics, glass, wooden pallets, garden and food waste. Biennial waste audits are conducted to educate the campus community about the importance of recycling and to identify measures to eliminate recyclables and refundables from the waste stream.

"Your Waste, Your Responsibility" is a desk-side recycling program launched in 2012 to encourage the responsibility of building occupants to empty their own recycling and waste receptacles by providing

offices with large receptacles for recycle materials and small containers for waste. The program also serves to direct all compostable and recyclable materials into the correct handling system. A Campus Composting Program has been in place for several years and has grown rapidly with an average of 40,000 kilograms of organic waste diverted from the landfill annually.

To encourage recycling in the labs, the Fisher/Corning Lab Plastics Recycling Program was implemented in 2010 in partnership with Fisher Scientific. 14,345 liters lab plastics have been diverted from the campus waste stream to date.

3.6 Water Management

In 2012 the campus completed the installation of a Wireless Irrigation Management Monitoring System to automatically adjust or cease watering times based on ambient temperature, precipitation and wind speed. Artificial turf has replaced the natural turf sports field on campus which also extends the playing season for UBC Okanagan athletes and students.

Sustainable Storm Water Management is an ongoing campus project which reduces its dependence on the City's storm water system by collecting water run-off into a campus retention pond. The pond acts as a filtration system for campus water run-off and natural habitat for plants, insects and birds.

In 2012 the installation of WaterFilz Kiosks in all academic buildings on campus was completed through a partnership between UBC and the UBC Student's Union Okanagan. The units purify and cool potable water, available to campus users who bring their bottles to the stations for fill-up. The Kiosks help reduce plastic bottle waste generated on campus, and provide digital counters that will track the number of plastic bottles reduced.

3.7 Community Engagement

Community engagement has been a key focus of the Okanagan Sustainability Office and will continue to expand with the implementation of future operational priorities.

A signature offering, the Campus Sustainability Tour Program was implemented by the Okanagan Sustainability Office in 2010 to educate campus users on the campus' sustainable features. The tour has engaged over 250 individuals, including staff, faculty, UBC students, local high school students, civic officials and members of the public.

The Okanagan Sustainability Office has also partnered with the Climate Action Secretariat, FortisBC and the Fresh Outlook Foundation to provide the Thompson-Okanagan Regional Climate Action Forum. The event welcomed leaders from government, business, public sector, non-profit, education, and members of the public to the campus to raise awareness about climate change, share best practices and develop to advance the Provincial Government's carbon neutral mandate.

In partnership with the Fresh Outlook Foundation, the Okanagan Sustainability Office has hosted and sponsored the REEL Change Sustainability Film Festival. The festival presents critically acclaimed documentaries that span myriad sustainability topics locally and globally.

3.8 Future Operational Priorities

3.8.1 Green Buildings

The investigation phase of the Building Optimization Program concluded in September 2013 which has resulted in baseline metrics and the identification of energy savings measures for implementation with a payback period of two years or less. The implementation phase of the program is anticipated to begin in the fall of 2013 and will involve the implementation of operational and technical retrofits in five original campus buildings.

3.8.2 Sustainability Planning

Commencing in 2013, the campus will begin to identify and develop sustainability goals and actions to address strategic operational sustainability areas of focus toward the development of a plan in collaboration with key stakeholders from the Okanagan and Vancouver campuses and community.

3.8.3 Community Engagement

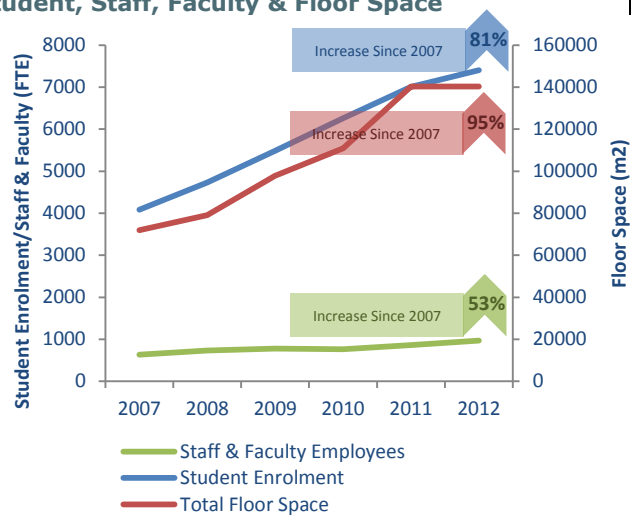
The "Power of You" is an executive-endorsed engagement strategy intended to raise awareness and reduce energy use on campus through voluntary behavior change and conservation practices. The first phase will focus on complementing controls and infrastructure-related energy reduction measures achieved through the Building Optimization Program. Students are participating in the "Power of You" through a pilot program supported by Student Housing and Hospitality Services to encourage cold water use for laundry to save energy.

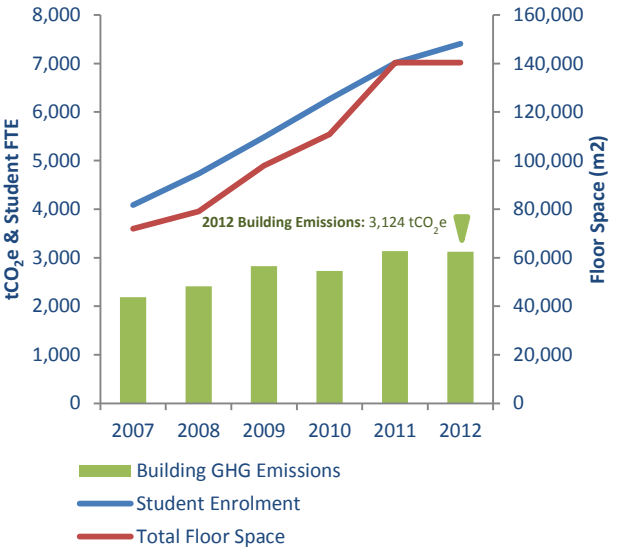
The first phase of the "Power of You" Program planning, volunteer recruitment and training has been completed, marked by its official launch in October 2013. Partners, Fortis BC and City of Kelowna representatives attended this event in support of the campus' overall energy reduction strategy which complements the local community's Okanagan Energy Diet Program.

3.9 Selected Measures of Operational Sustainability

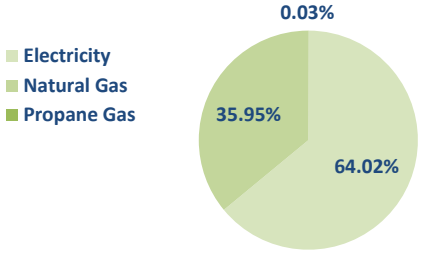
A. SUMMARY OF PERFORMANCE METRICS – OKANAGAN CAMPUS

	Metrics	2012 Performance	Trends
Context	**Staff and faculty employees** (FTE)	967 FTE	**Student, Staff, Faculty & Floor Space**
	Student enrolment (FTE)	7,406 FTE	
	Floor space (m^2)	140,370 m^2	
Energy & Emissions	**Building GHG Emissions**	3,124 tCO_2e	**Building GHG Emissions**
	GHG emissions per student (tCO_2e/ student FTE)	0.42 tCO_2e/ student FTE	
	Campus energy sources by GJ (%)	Natural Gas: 35.95% Electricity: 64.02% Propane Gas: 0.03%	**Campus Energy Sources by GJ (2012)**

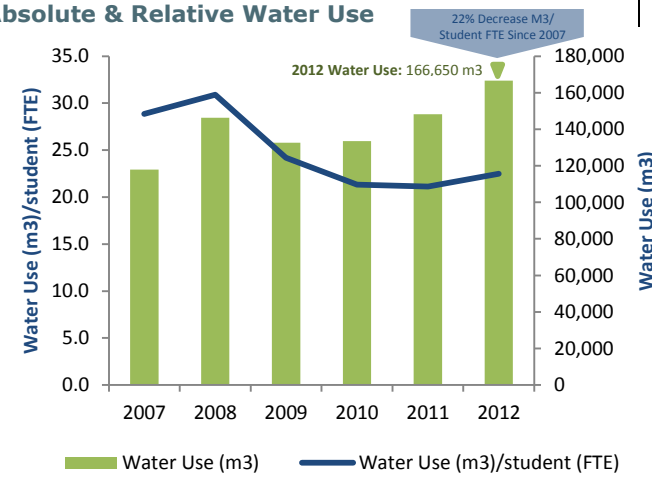


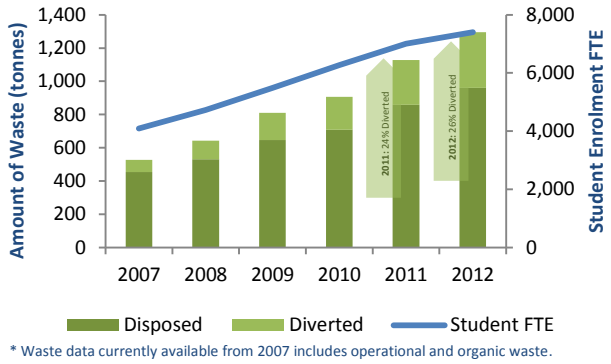


* UBC's Okanagan campus reports on buildings emissions only for comparison to 2007 baseline.

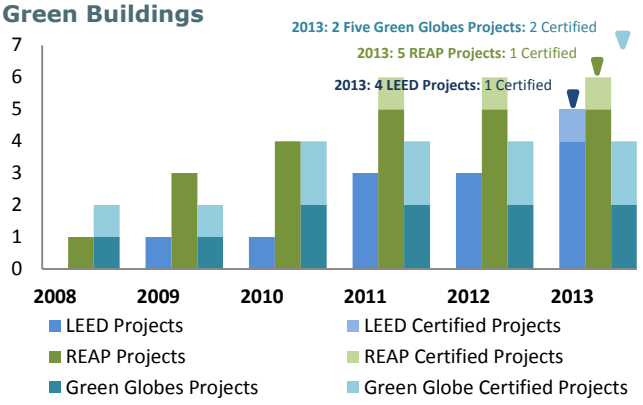


	Metrics	2012 Performance	Trends
Water	**Absolute water use** (m^3)	166,650 m^3	**Absolute & Relative Water Use**
	Water use intensity (m^3/ student FTE)	22.5 m^3/student FTE	
Materials & Waste	**Total waste generated** (tonnes)	1,295.9 tonnes	**Waste Generated & Diversion Rate**
	Total waste generated per student (tonnes/ student FTE)	0.17 tonnes / student FTE	
	Overall diversion rate (%)	26% diversion	
Green Buildings	**LEED projects and certified buildings** (# of projects)	4 projects 1 certified (all LEED Gold)	**Green Buildings**
	REAP projects and certified buildings (# of projects)	5 projects 1 certified	
	Green Globes* projects and certified buildings (# of projects)	2 projects 2 certified	
Living Lab/ Integration	**Active CLL projects** (#)	3 projects	n/a (this is the first year this data was collected)





* Waste data currently available from 2007 includes operational and organic waste.



* Five Green Globes certification is equivalent to achieving LEED® Platinum accreditation.

	Metrics	2012 Performance	Trends
Campus Engagement	**Campus Sustainability Tours** (ongoing) (# of engaged individuals)	250+ individuals engaged	**Campus Engagement Programs - 2010-12 Performance**
	Thompson Okanagan Regional Climate Action Forum (completed) (# of engaged individuals)	300 participants (incl. community members, staff, faculty & students)	
	REEL Change Sustainability Film Festival (completed) (# of engaged individuals)\	40 staff & faculty 200 community members (incl. staff, faculty & students)	

3.10 External Recognition and Awards

High Performance Building Design/Award Overview (2008 -2012)

Completion Date	Building	Building Design Performance Standard	Awards Received	Projected Energy Savings Over Conventional Building Performance Design
2012	**Engineering, Management & Education**	LEED Gold certification underway	2012: FortisBC PowerSense New Construction Award. $21,297.15 rebate for cooling. KWh saved = 425,943 ** 2010: Canadian Construction Association's Gold Seal Project Award of Recognition.	46% *
2012	**Reichwald Health Science Centre**	LEED Gold certification Achieved	2012: FortisBC PowerSense New Construction Award. $9,372.60 rebate for cooling. KWh saved = 187,452 **	49% *
2011	**Campus Geo-Exchange District Energy System**		2012: FortisBC electricity rebate of $57,106.71 for installation of VFD/Motors. 2012: $49,480.00 FortisBC Gas Efficient Boiler Program rebate. Annual predicted gas savings are 991 GJ 2008: $2.9 million received from the Provincial and Federal government through the Knowledge Infrastructure Program fund to retrofit all legacy academic buildings to geothermal heating.	
2011	**Purcell Residence**	REAP (Residential Environmental Assessment Program) Gold Certification	2012: REAP Gold Level Certification 2012: Thompson Okanagan Commercial Building Award 2012: Re/Max Thompson Okanagan Commercial Building Award 2011: $58,192.30 FortisBC PowerSense Award for energy efficiency measures in design and construction. Kwh saved = 581,923 **	45% *
2011	**Arts & Sciences II**	Five Green Globes (equivalent of LEED Platinum)	2012: FortisBC PowerSense New Construction Award. $12,265.00 rebate for cooling. KWh saved = 245,300 ** 2010: Five Green Globes from the Building Owners and Managers Association of Canada	45-50% *
2009	**University Centre**	Built to LEED Gold standard	2009: FortisBC PowerSense Conservation Excellence Award for cooling/heating. $56,250.00 rebate. KWh saved = 1,125,000 **	49% *
2008	**Charles E. Fipke Centre for Innovative Research**	Five Green Globes (equivalent of LEED Platinum)	2012: Arts & Sciences II and Fipke Centre buildings are the first campus buildings in the world to each receive five Green Globes Awards and are also the first paired buildings to attain this distinction. 2008: $127,000 rebate from FortisBC PowerSense Partners in Efficiency. KWh saved = 1,422,382 ** 2007: Five Green Globes from the Building Owners and Managers Association of Canada	46% *
2008	**Cascade Residence**		2008: FortisBC PowerSense Conservation Excellence Award for energy conservation measures. $20,457.75 rebate. KWh saved = 409,155**	

*- data provided by UBC Properties Trust

**- FortisBC has awarded approximately over $375,000 in rebates for 6,300,000 annual kilowatt hour savings and $375,000 in annual utility savings, over buildings of conventional design.