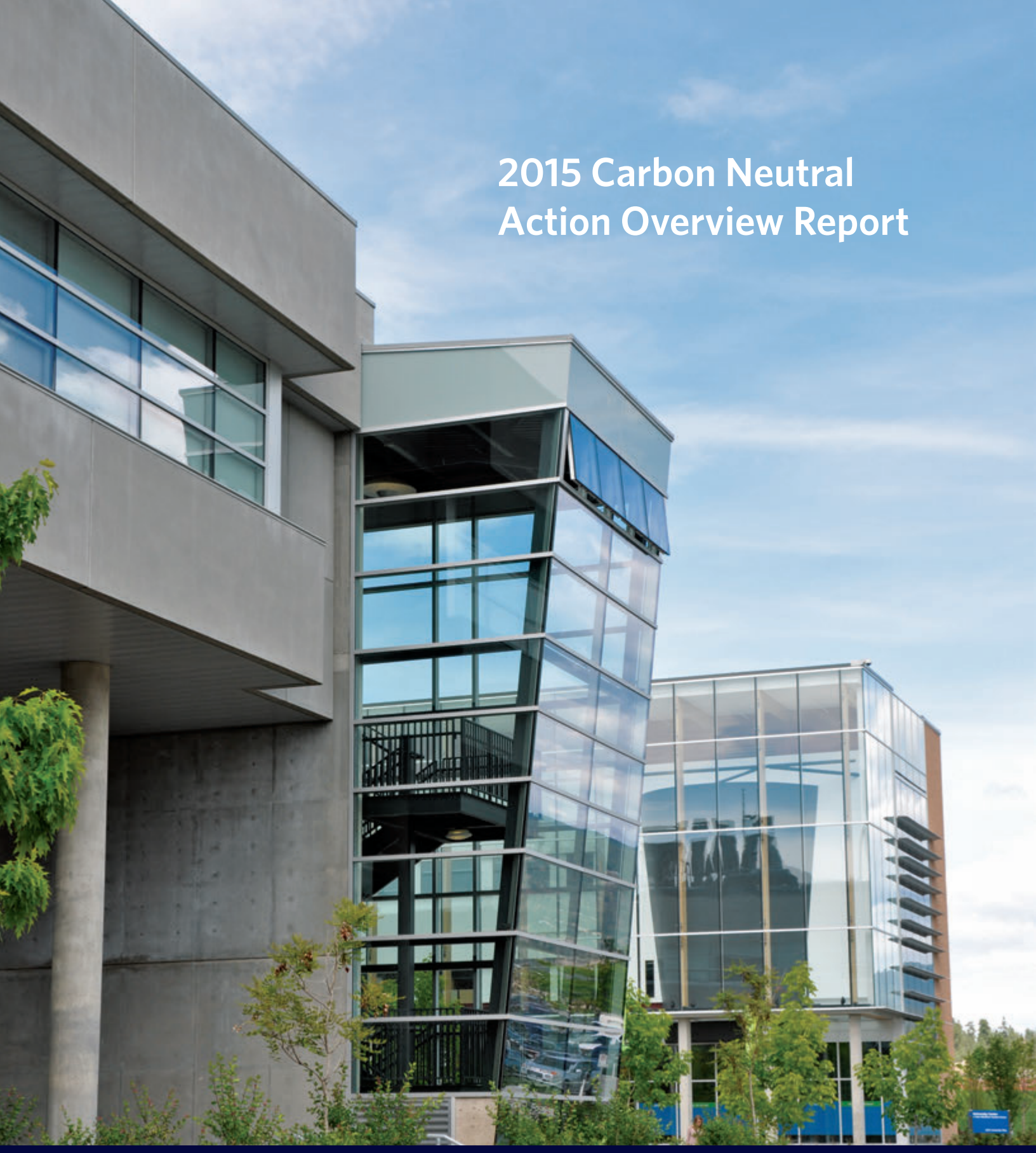


# 2015 Carbon Neutral Action Overview Report

a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

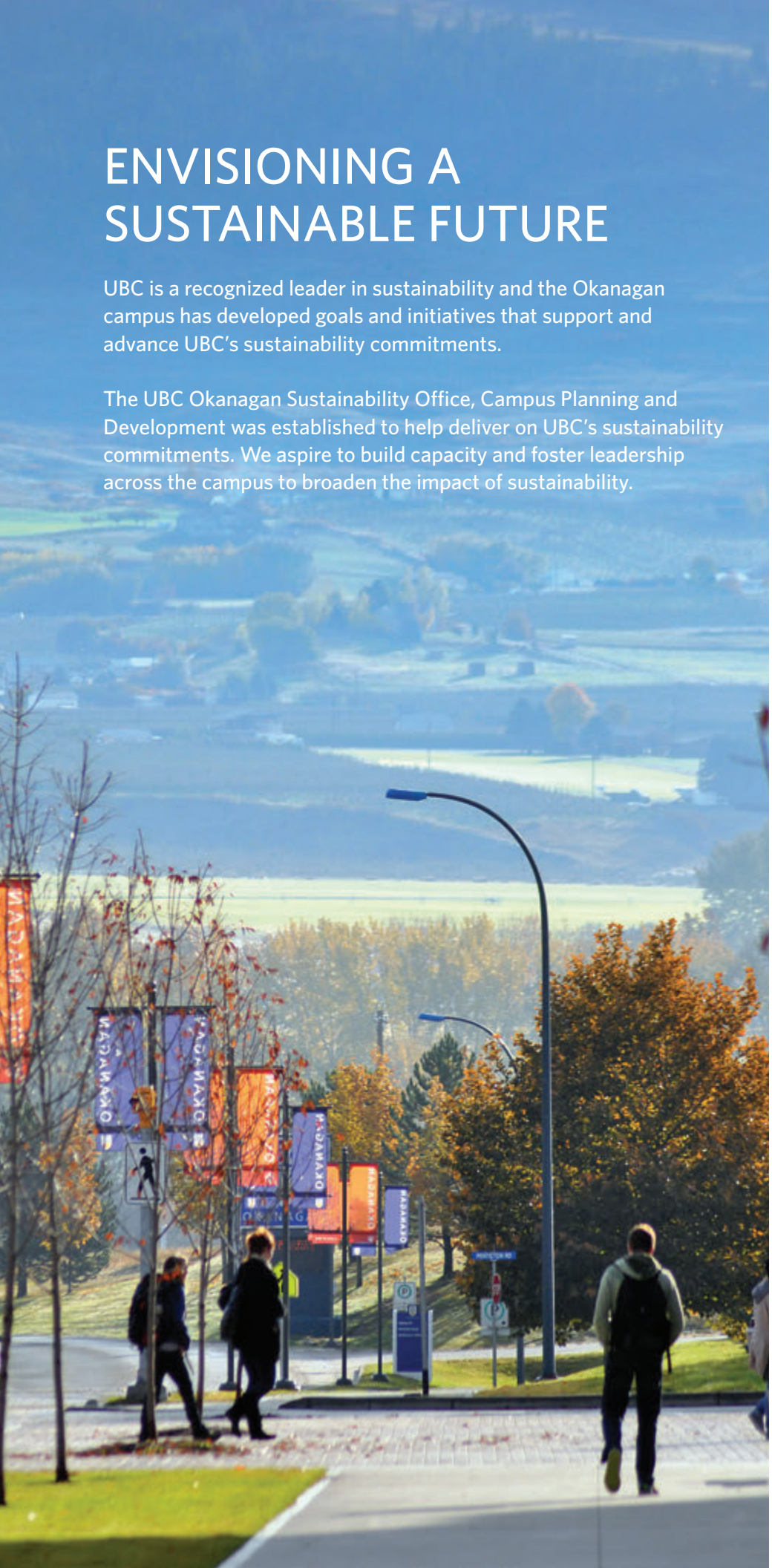
sustainability

OKANAGAN CAMPUS

# ENVISIONING A SUSTAINABLE FUTURE

UBC is a recognized leader in sustainability and the Okanagan campus has developed goals and initiatives that support and advance UBC's sustainability commitments.

The UBC Okanagan Sustainability Office, Campus Planning and Development was established to help deliver on UBC's sustainability commitments. We aspire to build capacity and foster leadership across the campus to broaden the impact of sustainability.



*Provincially mandated greenhouse gas (GHG) and sustainability reporting for the Okanagan campus is the responsibility of the Sustainability Office, Campus Planning and Development. The 2015 Carbon Neutral Action Overview Report contributes to UBC reporting submitted to the Climate Action Secretariat. This report provides an overview of the actions taken by the campus to reduce carbon emissions in 2015 and future planned actions to support British Columbia's commitment to reduce the provincial GHG emissions by 80 per cent below 2007 levels by 2050.*

**Acknowledgements**
Many unit level actions reflected in this report have contributed to the reduction of campus carbon emissions. Their continued commitment to sustainable development has been instrumental to advancing the campus' collective sustainability goals.

Business Operations
Campus Operations and Risk Management
Campus Planning and Development
Finance
IT, Media and Classroom Services
Payment and Procurement Services

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# SECTION CONTENTS

# EXECUTIVE SUMMARY AND DECLARATION

UBC's Okanagan campus continued to exemplify its commitment to environmental performance in 2015 through the continuous optimization of campus facilities and district energy systems, the ongoing pursuit of operational improvements and efficiencies, and the integration of sustainability in campus planning.

Over the past year, the campus achieved a 17 per cent reduction in absolute carbon emissions, 14 per cent of which is attributable to a reduction in building emissions. A strategic focus on demand side energy reduction—with the support of over $85,000 in provincial Carbon Neutral Capital Program (CNCP) funding, ongoing routine capital investments, and FortisBC partnership funding—contributed to this achievement.

In 2015, the campus undertook a significant building and infrastructure analysis as part of a broader sustainability planning process that helped to advance early actions toward the achievement of the campus' 2050 Whole Systems Goals. Arising from the UBC-endorsed Campus Plan (2015), the Whole Systems Infrastructure Plan will provide the roadmap and implementation framework for future infrastructure needs and environmental stewardship to support sustainable campus growth, community well-being and ecological resilience.

In the coming year, the campus will focus on the implementation of our plans through leading policy, the establishment of innovative programs and the implementation of energy and infrastructure projects, with the objective to achieve energy and greenhouse gas emission reductions. Integral to this process will be the incorporation of whole systems recommendations into planning and operational projects currently underway.

**Rob Einarson**

Associate Vice-President, Finance and Operations

University of British Columbia, Okanagan campus

## DECLARATION STATEMENT

This Carbon Neutral Action Report for the period January 1, 2015 to December 31, 2015 summarizes our emissions profile, the total offsets to reach net-zero emissions, the actions we have taken in 2015 to reduce our greenhouse gas emissions, and our plans to continue reducing emissions in 2016 and beyond.

By June 30, 2016, the Okanagan campus' final Carbon Neutral Action Report will be posted to our website at *sustain.ok.ubc.ca/reports/cnar*

# EMISSIONS AND OFFSET SUMMARY

## EMISSIONS AND OFFSET SUMMARY

| UBC Okanagan campus GHG Emissions and Offset for 2015 ($tCO_2e$) | |
|---|---|
| GHG Emissions created in Calendar Year 2015: | |
| Total Emissions ($tCO_2e$) | 2,601 |
| Total Offsets ($tCO_2e$) | 2,599 |
| Adjustments to GHG Emissions Reported in Prior Years: | |
| Total Emissions ($tCO_2e$) | 0 |
| Total Offsets ($tCO_2e$) | 0 |
| Grand Total Offsets for the 2015 Reporting Year: | |
| Grand Total Offsets ($tCO_2e$) | 2,599 |

## RETIREMENT OF OFFSETS

In accordance with the requirements of the Greenhouse Gas Reduction Targets Act and Carbon Neutral Government Regulation, UBC's Okanagan campus (the Organization) is responsible for arranging for the retirement of the offsets obligation reported above for the 2015 calendar year, together with any adjustments reported for past calendar years. The Organization hereby agrees that, in exchange for the Ministry of Environment ensuring that these offsets are retired on the Organization's behalf, the Organization will pay the associated invoice to be issued by the Ministry in an amount equal to $25 per tonne of offsets retired on its behalf plus GST.

# 2015 EMISSIONS OVERVIEW

## GREENHOUSE GAS EMISSIONS

The following greenhouse gas (GHG) emissions have been quantified using the BC Provincial Government's SMARTTool Reporting Framework.

***Table 1: GHG Comparison by Source between 2014 - 2015***

| Source | 2014 Emissions (tonnes $CO_2e$) | 2015 Emissions (tonnes $CO_2e$) | Change from 2014 to 2015 |
|---|---|---|---|
| Buildings | 2,746 | 2,370 | -14% |
| Fleet | 42 | 45 | +9% |
| Paper | 69 | 63 | -8% |
| Fugitive | 268 | 122 | -54% |
| Total Emissions | 3,125 | 2,601 | -17% |
| Total Offsettable emissions | 3,123 | 2,599 | -17% |

**Individual amounts may not sum exactly due to rounding.*

Table 1 demonstrates an absolute campus GHG emission reduction of 17 per cent over the 2014 reporting year, which will result in a $14,000 carbon offset savings to the university. Building emissions have been reduced by 14 per cent. Contributing factors to this reduction include a focus on demand side energy reduction through building optimization, CNCP projects, routine capital investments, building re-commissioning, maintenance of the District Energy System (DES), behaviour change, and a more temperate heating season. Detailed information on measures implemented to achieve a reduction in emissions over the previous and baseline years can be found in the Emissions Reduction Activities section of this report.

### Carbon Neutral Offsets in 2015

In accordance with the campus SMARTTool[1] reporting and as required by the Greenhouse Gas Reduction Targets Act (GGRTA), offsets required to achieve carbon neutrality in 2015 total 2,599 $tCO_2e$. As part of the Okanagan campus' 2015 GHG emissions profile, two $tCO_2e$ do not require offsets.

[1] *Protocols established in 2014/2015 BC Best Practices Methodology for Quantifying Greenhouse Gas Emissions*

# EMISSIONS REDUCTION ACTIVITIES

## ACTIONS TAKEN TO REDUCE GREENHOUSE GAS EMISSIONS IN 2015

The following provides an overview of actions and plans reported in the CNAR Actions Form, Section 1.

### A. Stationary Fuel Combustion, Electricity (Buildings)

The largest source of in-scope GHG emissions on campus is derived from buildings which comprised 91 per cent of in-scope emissions in 2015. However, notably, absolute building emissions decreased by 376 $tCO_2e$ or 14 per cent as compared to the 2014 reporting year. This demonstrates a continued emissions reduction trend over prior reporting years. Specific actions taken in 2015 to reduce building emissions include the following:

#### ACTIONS:

#### Academic & Administration Buildings

- Implemented Energy Conservation Measures (ECMs) in two remaining legacy academic facilities under the final phase of the Building Optimization Program (BOP), projected to save *160 $tCO_2e$ annually.
- Completed domestic hot water upgrade project in Science building projected to save 48,900 kWh, 177 GJ and $1,361 in operational costs and 19 $tCO_2e$ annually.
- Completed domestic hot water upgrade and boiler replacement project in Charles E. Fipke building anticipated to reduce carbon emission by 10 $tCO_2e$ annually.
- Undertook evaluation of overall building use in five academic and administration buildings.
- Connected WIFI occupancy control in two academic buildings.
- Implemented sub-metering in seven locations to improve measurement of energy consumption and conservation planning, including peak demand.
- Completed audit of lighting systems in academic buildings and parking lots to baseline to inform future lighting upgrades.
- Completed Engineering, Management and Education (EME) building commissioning to fix HRV heat recover and heat pump.
- Conducted lighting retrofits in Engineering, Management and Education (EME) building, Fipke Theatre and parking lot R.
- Fostered energy-reduction behaviour change among building occupants to support energy efficient actions such as turning off lights and powering down equipment when not in use.
- Early implementation of opportunities to improve building performance identified through a UBC system-wide whole systems infrastructure planning exercise undertaken in 2015.

#### Residence Buildings

- Undertook evaluation of overall building use in seven residence buildings.
- Replaced all washers and dryers with newer models.
- Implemented laundry appliance programming update to allow for half-hour drying cycles.
- Conducted lighting retrofits and upgrades to Cassiar residence, replacing 110 fixtures utilizing T5 (55W) bulbs with efficient LED (24W) bulbs, projected to reduce electricity consumption related to building lighting by 78 per cent.

** Emissions savings based on emission factors for natural gas and electricity by buildings, as illustrated in Table 1: Stationary Fuel Combustion (p.12) and Table 3: Purchased Electricity (p.15) of the 2014/2015 B.C. Best Practices Methodology for Quantifying Greenhouse Gas Emissions.*

### B. Mobile Fuel Combustion (Standard and Non-Standard Fleet)

In 2015, fleet vehicles accounted for 45 $tCO_2e$, or 1.7 per cent of campus total emissions, up four $tCO_2e$ from 2014. Higher use of the research fleet is a contributing factor for this increase. Although there was a slight increase in fleet emissions, the campus has achieved a 33 per cent absolute reduction in fleet emissions since 2010. Specific actions taken in 2015 to reduce fleet emissions include the following:

#### ACTIONS:

- Converted 100 per cent of UBC Okanagan's golf carts to electric models.
- Reduced campus fleet by two Faculty research vehicles.
- Continued to implement measures to reduce reliance on fleet vehicles and divert the number of trips taken by encouraging fleet carpooling, walking or cycling, as well as consolidating off-campus trips.

- 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.

### C. Supplies (Paper)

In 2015, emissions from paper accounted for 63 $tCO_2e$, or 2.4 per cent of total in-scope campus emissions. This demonstrates a reduction of eight per cent over 2014. An increase in higher PCR content paper purchases in 2015 and a reduction of overall package purchases are contributing factors to this reduction. Specific actions taken in 2015 to reduce this scope area include the following:

#### ACTIONS:

- Completed full implementation of PaperCut™ print tracking software program to students. Further information on PaperCut™ can be found in the Above and Beyond Reporting section of this report.
- Completed preliminary implementation of PaperCut™ print tracking software program to faculty and staff at departmental and unit level.
- Continued to expand workstation video conference technology availability and accessibility, integrating smaller systems with existing larger meeting room systems.
- Continued to promote purchase of paper with 30 per cent or greater post-consumer waste content.
- Continued to ensure that wheat sheet paper is available to order from the custom list, as an alternative source to tree-derived paper.
- Continued to increase the number of digital signs and electronic communication platforms available across campus to share campus news, activities and events, thereby reducing the reliance on paper-based promotional materials.

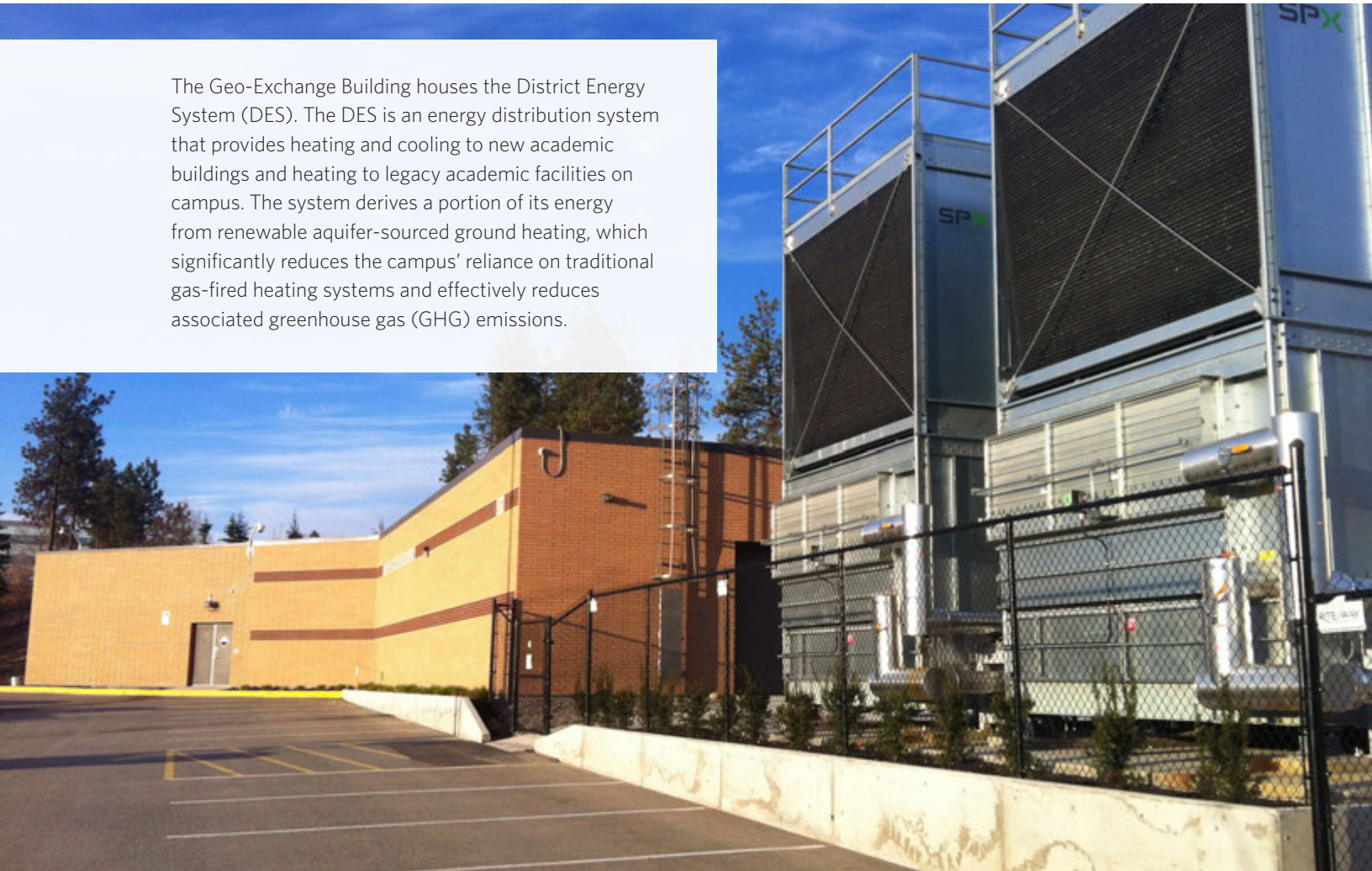
### D. Fugitive Emissions

In 2015, 122 $tCO_2e$ in-scope HFCs accounted for 4.7 per cent of total campus fugitive emissions, which is a reduction of 54 per cent from 2014.

#### ACTIONS:

- Continued the preventative maintenance and upgrades to HVAC system and associated appliances to minimize fugitive emissions.

The Geo-Exchange Building houses the District Energy System (DES). The DES is an energy distribution system that provides heating and cooling to new academic buildings and heating to legacy academic facilities on campus. The system derives a portion of its energy from renewable aquifer-sourced ground heating, which significantly reduces the campus' reliance on traditional gas-fired heating systems and effectively reduces associated greenhouse gas (GHG) emissions.



## PLANS TO CONTINUE REDUCING GREENHOUSE GAS EMISSIONS 2016-2017

In 2015 the campus undertook a substantive sustainability planning exercise to identify short term and long term measures toward its carbon and energy reduction goals. This section describes planned actions across buildings, fleet and procurement in the coming year.

### A. Stationary Fuel Combustion, Electricity (Buildings)

- Develop proposals to convert gas-fired hot water tanks in legacy academic facility to heat pumps for domestic hot water use.
- Implement routine capital project to replace the Arts Building Chiller CH-2 and Administration Building Chiller (subject to funding).
- Implement routine capital project to replace Administration building cafeteria make-up air unit, anticipated to reduce carbon emissions by 69 $tCO_2e$ per year (subject to funding).
- Re-commission and balance air, water and controls in one building per year.
- Continue to implement sub-metering and BMS enhancements for better measurement of energy consumption and conservation planning, including peak demand.
- Continue to complete audits of campus lighting systems to inform future lighting upgrades in buildings and parking lots.
- Continue LED bulb replacement in remaining residence buildings.
- Complete full automation of residence buildings.
- Complete hot water heater replacement review.
- Complete planned energy study for CHP, DES and building heat pumps.
- Complete additional sourcing of alternative heating and cooling for DES.
- Complete an energy study on the Administration building.
- Implement FortisBC's Partners In Energy Program, a program that provides direct lighting rebates at the point-of-sale.
- Continue implementation of the UBC Okanagan Whole Systems Infrastructure Plan, including the following actions :
  - Secure seed funding to implement Year 1 Energy Conservation Measures identified in the Plan.
  - Develop an Energy Team and Energy Committee.
  - Complete and begin implementation of a five-year Strategic Energy Management Plan.
  - Continue to assess routine capital plan to determine energy efficient implementation options that respond to recommendations of the Whole Systems Infrastructure Plan and Strategic Energy Management Plan.
  - Develop and obtain endorsement of a campus-wide energy policy.
  - Implement CNCP project Lab Air Volume Control and Green Labs Education in Science building laboratories (funding pending). Projected energy reductions total 278,900 kWh and 1,050 GJ, saving $26,600 in operational costs and 58 $tCO_2e$ annually.
  - Develop and begin implementing a three-year behaviour change energy and environmental stewardship plan.
  - Update campus design guidelines and define new construction recommendations for efficient buildings (i.e. solar-thermal ready).

### B. Mobile Fuel Combustion (Standard and Non-Standard Fleet)

- Continue the 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.

- Continue to encourage fleet carpooling, walking or cycling, and consolidating off-campus trips to reduce operational reliance on fleet vehicles.

### C. Supplies (Paper)

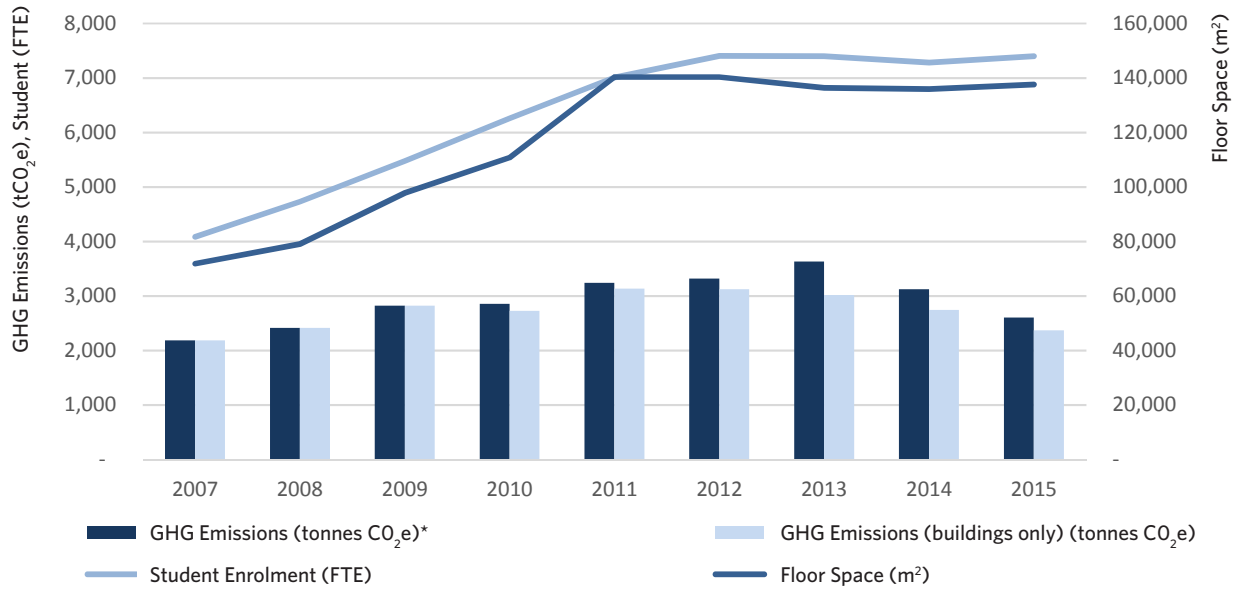
- Complete a review of alternative web-conferencing software LYNC.
- Complete the full implementation of PaperCut™ print tracking software to faculty and departments, providing a platform that delivers reports to clients on printing volumes and generates awareness and promotes alternatives to printing.
- Implement Xerox fleet enhancement.
- Continue to promote the purchase of paper with 30 per cent or greater post-consumer recycled content.
- Continue to ensure wheat sheet paper is available to order from the custom list, as an alternative source to tree-derived paper.
- Continue to increase the use of digital signs and electronic communication platforms within buildings to share news, activities and events, thereby reducing the reliance on paper-based promotional materials.
- Continue the replacement of desktop computers with laptops and more efficient devices as part of IT, Media and Classroom Services' Computer Replacement Program.

# EMISSIONS IN GREATER DETAIL

## COMPARISON TO BASELINES

Figure 1 provides a comparison of absolute campus and building emissions since 2007 relative to growth. From 2007 to 2015, student enrolment increased by 81 per cent while floor space has increased by 91 per cent. Despite growth, absolute emissions have remained relatively steady, largely due to sustainable development through investment in district energy systems (DES) infrastructure and operation. The DES has significantly reduced the campus' reliance on gas-fired heating equipment.

Figure 1 Absolute GHG emissions relative to growth 2007-2015




**Total GHG Emissions for 2007-2009 reported buildings only emissions; 2010-2015 includes all in-scope emissions.*

# ABOVE AND BEYOND:
# Promoting a Culture of Sustainability

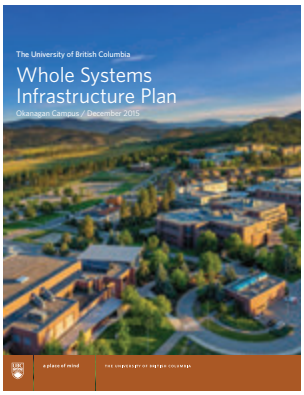
## ENERGY CONSERVATION PHILOSOPHY & PRACTICES

### Whole Systems Approach to Sustainability Planning

The UBC Okanagan Whole Systems Infrastructure Plan (Plan) was conceived during the 2015 Campus Plan development process to assess and plan for future infrastructure needs that support campus growth and climate change impacts. The Plan establishes a long-term roadmap and a five-year implementation plan to achieve campus sustainability performance across built and natural environments to 2030 and beyond.

The Plan takes a fundamentally different approach from traditional engineered infrastructure systems, where we would typically look at infrastructure investment on a system-by-system basis. As the whole systems name implies, it views the entire campus as a system and identifies a number of strategic opportunities through existing operations and upcoming capital projects to reduce long-term operational costs, maintenance, and improve campus performance over the long term.

Through the development of the Okanagan Campus Plan (2015), the campus established the following set of performance goals for the campus that have guided the development and creation of the Plan. The campus' economic sustainability is at the forefront of the Plan's implementation and the following goals are rooted in the need to constantly improve operational efficiencies, develop best practices, reduce infrastructure costs, and ensure that infrastructure decisions are made in a fiscally responsible manner to support the long term financial sustainability of the campus.




2050 WHOLE SYSTEMS SUSTAINABILITY GOALS

**GOAL #1:** Achieve a net positive performance in operational energy and carbon.

**GOAL #2:** Implement a framework that supports low embodied carbon in future development.

**GOAL #3:** Optimize water quality, supply and security.

**GOAL #4:** 100 per cent diversion of stormwater from municipal systems.

**GOAL #5:** Strive towards full waste recovery/reuse.

**GOAL #6:** Enhance and/or restore the site's ecology.

In order to achieve the performance goals, the following Plan objectives were created to provide an overarching framework for analysis and assessment of recommendations proposed for implementation.

- Reduce long term operational costs, reduce maintenance, and improve performance.
- Respond to potential future growth and climate risks, including the management of energy, carbon, water and waste, and associated costs; protect and enhance biodiversity and ecological assets on campus.
- Provide a framework to engage the academy and campus community in the Plan's implementation through research, student learning and stewardship.
- Contribute to the well-being of students, faculty and staff and improve productivity and performance, making the campus a desirable place to work, live and learn.
- Exemplify UBC's sustainability leadership by responding to its sustainability aspirations in Place and Promise: The UBC Plan, Aspire, The UBC Okanagan Campus Plan (2015), The UBC Climate Action Plan, and regenerative sustainability in the UBC 20-Year Sustainability Strategy (2014).

## ENERGY AND CARBON REDUCTION PROGRAMS PROVIDING RESULTS

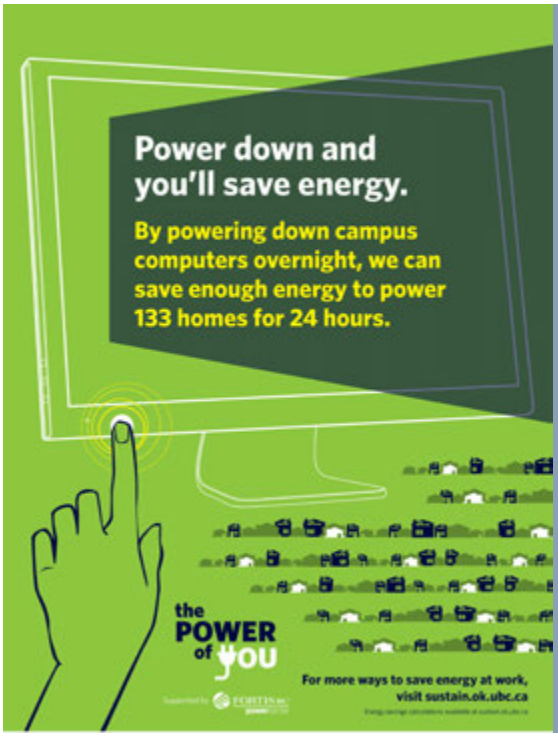
### Building Optimization

Last year represented the final year of the Building Optimization Program (BOP), a three-year program developed in partnership with UBC and FortisBC to implement energy conservation measures in five legacy academic facilities across campus. In 2015, the Building Optimization Program saved the campus over $150,000 in ongoing annual utility costs in a 0.7 year payback period—the equivalent to a 140 per cent return on investment.

Building optimization is supported by the Power of You, an executive-endorsed voluntary behaviour change energy conservation program.

### Lighting Upgrades

A number of interior and exterior lighting upgrade projects were undertaken in the academic, administration and residence buildings in 2015, which achieved nearly $3,000 in FortisBC rebates and direct point-of-purchase rebates in-store. Lighting upgrades in academic and administration buildings included the removal of ballasted pot lights, wall packs and compact fluorescents for replacement with energy efficient LED alternatives. The Cassiar residence underwent a lighting upgrade that involved the replacement of 110 fixtures utilizing two T5 (55W each) bulbs with 110 more efficient LED (24W) bulbs. This upgrade is projected to reduce electrical consumption related to lighting by 78 per cent.




### The Power of You

The Power of You engages the campus community in a range of energy reduction campaigns across offices, classrooms, labs and student residences that has contributed to energy awareness and efficiency on campus.

Actions taken by key operational departments in 2015 in response to the Power of You Turn Off the Lights and Power Down campaigns involved a staff-led audit across academic and administration buildings. As a direct result of the audit, over 7,000 lights and 250 projectors and monitors were turned off or powered down and over 1,500 windows were closed at night, contributing to campus energy savings.

In 2016 the campus will complete the development of a new three-year Behaviour Change Energy and Environmental Stewardship Plan—a key recommendation of the Whole Systems Infrastructure Plan, in order to leverage and scale up the Power of You's success. The energy stewardship plan will continue to focus on community engagement, awareness and education designed to build capacity and encourage voluntary energy, waste and water conservation actions, as well as measures to support campus ecology and biodiversity.

## Campus Irrigation Project

Anticipating significant improvements to irrigation efficiency, water conservation and associated costs, the campus initiated phase two of a three-year irrigation upgrade project in 2015. This phase focuses on a second zone, selected by priority, and will identify deficiencies related to irrigation distribution uniformity, water savings and maintenance. Implementation of projects, such as transitioning from spray to drip irrigation and installing water meters by zone, were completed.

## Paper Reduction Program: PaperCut™

UBC's Okanagan campus launched the PaperCut™ software program in 2015. The program provides the opportunity to monitor and reduce paper consumption through measures which include print reporting, secure print release and multi-machine printing capabilities. The program's first stage of implementation enables students to monitor, measure and receive printing awareness prompts. Preliminary program services were introduced to faculty and staff, with the intention to roll-out the full scale of program services in 2016.


## Student Engagement in Campus Operations and Planning

The campus continued to support student engagement in sustainability projects that yield benefit to campus planning and operations while integrating meaningful student learning opportunities.

Student capstone projects undertaken by engineering students in 2015 include a Stormwater Catchment Project and a Campus Renewable Energy Biomass Feasibility Project. The biomass project is intended to help inform a key recommendation within the Whole Systems Infrastructure Plan, which identifies future conversion of campus energy systems to biomass once an optimal District Energy load has been achieved. The Stormwater Catchment Project will provide input into the development of an Integrated Stormwater Management Plan for the campus.

## Student Leadership in Sustainability

UBC Okanagan Purcell Residence students have established a team aimed toward building sustainability leadership among peers through behaviour change and awareness program initiatives. In 2015, students led a recycle your coffee cup campaign which raised awareness about the amount of waste generated from single-use disposable cups that could have been otherwise diverted from the landfill through campus recycling programs. The students subsequently developed composting and refundable container pilot programs which were successfully adopted. As a direct result of this success, it is anticipated that both programs will be implemented across student residences commencing in 2016/17.

## PurNiKal Classic

The PurNiKal Classic is a student-led social engagement program developed by student resident advisors to unite Integrated Learning Communities (ILCs), groups of students living in residences in civic engagement across the campus. The program builds social sustainability into the fabric of campus life, encouraging health, well-being and a sense of belonging and comradery among students.

Four events were hosted in 2015 between three student residences engaged in a friendly, fun-spirited competition. Themes included: Be a Civic Leader, Be Sustainable and Engage Traditions.

Under Be Sustainable participants were encouraged to:

- Take public transit
- Explore the Learning Garden
- Go on a hike
- Clean up outside by picking up garbage or recycling
- Get a plant for your room (bonus for naming it)
- Use a reusable container or mug at the cafeteria
- Find the Geothermal Building and #WhatGeothermalMeans

Seventy-three per cent of invited residents participated in the initiative.

Integrated Learning Communities (ILC):

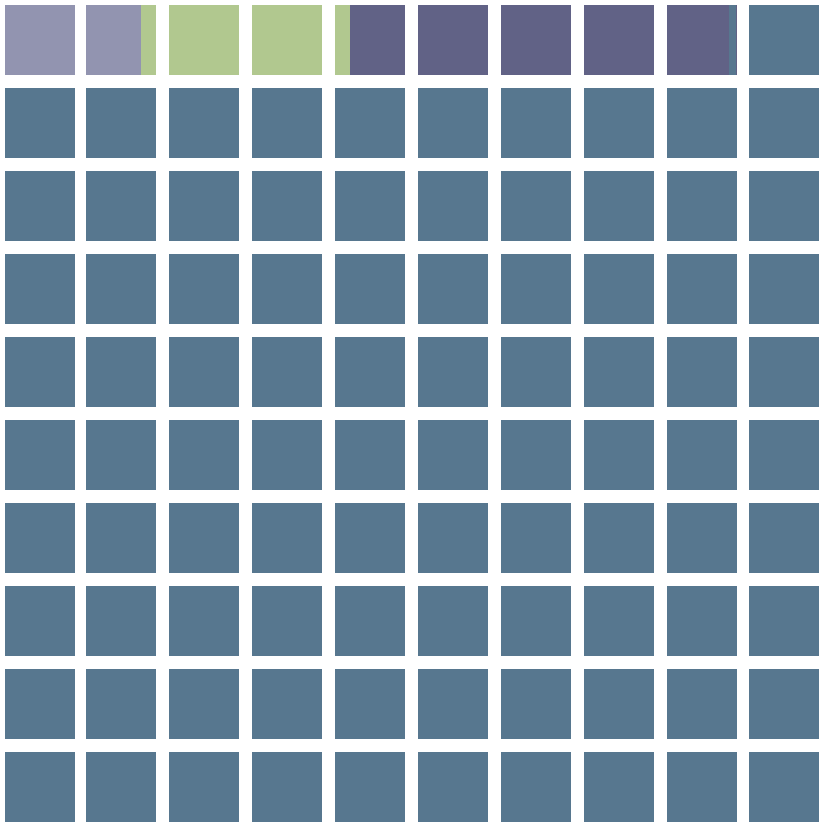
- Expressive Arts Community
- Healthy Living Community
- Indigenous Community
- Innovation and Technology Community
- International and Global Leadership
- Leadership and Civic Engagement Community
- Sustainable Leadership Community

## Students Vote "Yes" to Continued U-Pass Program

The Universal Bus Pass (U-Pass) Program was initiated 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 students a low-cost, sustainable transportation option to campus provided by Kelowna Regional Transit. Aligned with a general fare increase proposed by the Kelowna Regional Transit partners, a student referendum was held in 2015 in which 84 per cent of voting students gave the green light to raise the U-pass from $60 to $70 per term—the same cost as a single-month adult pass. The Senior Executive team at UBC Okanagan remains committed to a 10 per cent subsidy of the student U-Pass fees.

# GHG EMISSIONS BY SOURCE

## UBC OKANAGAN GREENHOUSE GAS EMISSIONS BY SOURCE FOR THE 2015 CALENDAR YEAR ($tCO_2e$*)



The following greenhouse gas emissions have been quantified using the BC Provincial Government's SMARTTool Reporting Framework.

| | |
|---|---|
| 1.7% 45 | Mobile (fleet and other mobile equipment) |
| 2.4% 63 | Supplies (Paper) |
| 4.7% 122 | Fugitive (Refrigerants) |
| 91.2% 2,370 | Stationary (Building Heating and Generators) and Electricity |

**TOTAL EMISSIONS: 2,601**

## OFFSETS APPLIED TO BECOME CARBON NEUTRAL IN 2015

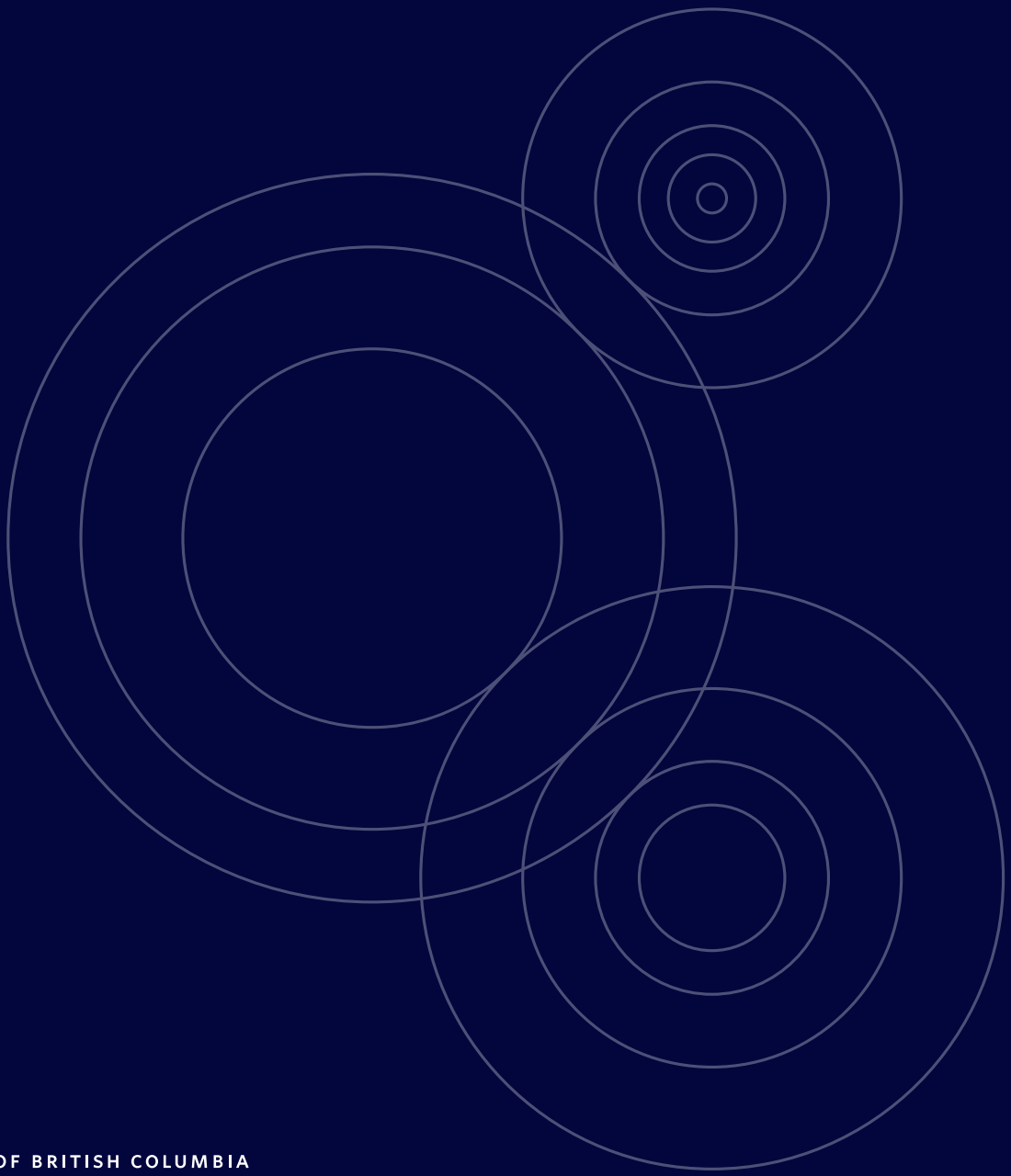
(Generated May 5, 2016 2:36 p.m.)

Total offsets required: 2,599. Total offset investment: $64,975.
Emissions which do not require offsets: 2. **

*Tonnes of carbon dioxide equivalent ($tCO_2e$) 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.

# 2015 CARBON NEUTRAL ACTION OVERVIEW REPORT FOR UBC'S OKANAGAN CAMPUS



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sustainability