



BOSA Building



# Capilano University Carbon Neutral Action Report

2016

Sustainability, *Facilities*



## **2016 Carbon Neutral Action Report**

This Carbon Neutral Action Report for the period January 1<sup>st</sup>, 2016 to December 31<sup>st</sup>, 2016 summarizes our emissions profile, the total offsets to reach net-zero emissions, the actions we have taken in 2016 to reduce our greenhouse gas (GHG) emissions and our plans to continue reducing emissions in 2017 and beyond.

By June 30, 2017, Capilano University's final *Carbon Neutral Action Report* will be posted to our website at <https://www.capilanou.ca/sustainability/Commitment/Reports/>

## Overview

At Capilano University we are as deeply connected with our natural environment as we are with local First Nations Communities. As such, we respectfully acknowledge the Lil'wat, Musqueam, Squamish, Sechelt and Tsleil-Waututh people upon whose territories our campuses are located.

We recognize that reducing our carbon impact and addressing climate change and sustainability concerns are integral to respecting the natural surroundings our campuses and developing a culture of conservation. We focus our efforts in several key areas:

- *Curricular and Extra Curricular Activities*  
Sustainability at Capilano teaches our students to be socially and environmentally responsible citizens on and off campus. Our faculty educates students on sustainability and create unique learning opportunities that make use of our natural environment;
- *Operations*  
We consistently optimize our operations in order to reduce consumption and mitigate the environmental impacts of our campuses. We actively seek out ways to improve our business practices and create opportunities for integrating operations and sustainability as learning opportunities. Our staff and faculty are also essential stakeholders in our effort to minimize our carbon impact so we engage them in meaningful programs and consistently listen to, and take action on their feedback, and;
- *Community*  
We engage and inform our greater community by developing strategic partnerships with external partners and by delivering accessible, inclusive sustainability programs that are driven by students. This student-led approach ensures that our students are connected to our community on relevant sustainability issues that extended beyond the classroom and borders of our campus.

We strive to lead by example and integrate environmental and social sustainability into all aspects of our campus community.

Our commitment to carbon neutrality is evident by our collective effort to exceed our GHG targets. Our greenhouse gas reduction target of 33% below 2007 baseline carbon emissions was dramatically exceeded by a 52.7% reduction in 2015. In 2016 we were grateful for the opportunity to share our success at the annual Climate Symposium, and honored to have been nominated in 2016 for the Premier's Award. We also continued to work diligently on our path to GHG reduction and celebrated our past success by holding a week-long, community-wide celebration of our GHG reduction accomplishments, during this event we:

- Integrated student learning into the event, celebrated our achievements and reaffirmed our commitment to 80% reduction;
- Hosted a "Campus of the Future" event with BC Hydro and other AVED institutions, and;
- Held an electric vehicle festival with a parade of electric cars, with many available for test drives

This Carbon Neutral Action Report illustrates many activities that we have undertaken in 2016 to progressively move toward our sustainability goals.

Lastly, we recognize that there is still work to be done to achieve our 80% reduction target. However, together with our many partners including the provincial government and BC Hydro, we are motivated to improve our progress and face future climate challenges.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jacquie Stewart', written in a cursive style.

Jacqui Stewart

Vice-President, Finance & Administration

## Emissions and Offsets Summary Table:

Capilano University GHG Emissions and Offsets for 2016 (tCO <sub>2</sub> e)	
GHG Emissions created in Calendar Year 2016:	
Total Emissions (tCO <sub>2</sub> e)	1,328
Total Offsets (tCO <sub>2</sub> e)	1,326
Adjustments to GHG Emissions Reported in Prior Years:	
Total Emissions (tCO <sub>2</sub> e)	0
Total Offsets (tCO <sub>2</sub> e)	0
Grand Total Offsets for the 2016 Reporting Year:	
Grand Total Offsets (tCO <sub>2</sub> e)	1,326

### Retirement of Offsets:

In accordance with the requirements of the Greenhouse Gas Reduction Targets Act and Carbon Neutral Government Regulation, Capilano University (**the Organization**) is responsible for arranging for the retirement of the offsets obligation reported above for the 2016 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.

### Executive Sign-off:



Signature

Jacqui Stewart

Name (please print)

Date

June 2, 2017

Vice President, Finance & Administration

Title

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## Introduction

### Targets & Baselines

Capilano University maintains two greenhouse gas (GHG) baselines and three energy baselines. The purpose of each of these is as follows:

- 2007 GHG baseline: Alignment with British Columbia's province wide greenhouse gas reduction goals
- 2010 GHG baseline: Alignment with British Columbia's Carbon neutral government legislation
- 2007 Energy baseline: Supports the 2007 GHG baseline
- 2010 Energy baseline: Supports the 2010 GHG baseline
- 2012 Energy baseline: Allows performance monitoring without the distortion of a major building addition

We set short, medium and long term targets for greenhouse gas reduction. GHG targets have not been altered since our commitment to carbon neutrality, and are:

- 33% reduction from 2007 baseline by 2015
- 67% reduction from 2007 baseline by 2020
- 80% reduction from 2007 baseline by 2050

While these are very aggressive GHG targets, the Capilano University community does discuss accelerating these targets. Our principle concern with acceleration is the availability of sufficient resources. While the specific target percentages are "aspirational", we have dramatically exceeded our first target and have realistic operational plans and capital projects that achieve our 2020 target. Longer range plans are in development.

### Risks and Challenges

When considering the risks to successfully achieving our targets, the availability of adequate technology is never a significant concern. Four largely financial factors concern Capilano University regularly when managing the risk of failing to meet GHG targets:

1. The availability of sufficient budget to adopt efficient technologies during aging infrastructure replacement
2. Competition for available budget to make essential investments in aging infrastructure
3. Macro-economic pressure on the business case for retrofits: low fossil fuel prices and rising clean electricity costs
4. Growth in energy use due to increased user demand and/or campus expansion

### Emissions Reduction Strategies

Our current success in reducing GHG relied on a combination of traditional emissions management strategies: behavior-based conservation of energy and paper, continuous optimization of building operations, building equipment technology upgrades and fleet efficiency improvements. As the returns diminish from these strategies, we are investigating, piloting and implementing three additional strategies:

1. Improving asset utilization,
2. Switching energy sources, and
3. Generating renewable or reclaiming wasted energy on-site.

All three strategies require additional investments in equipment, software and expertise; they impact operating costs.

## Energy & GHG Achievements

In 2016, our electricity reduction commitment to BC Hydro for participation in the Energy Manager and Workplace Conservation Action programs was 400,000 kWh. The massive measures taken in 2015 continue to help to reduce our electricity costs. External financial support for GHG reduction and BC Hydro programs declined in 2015 and 2016 respectively. Aside from this, and despite a colder winter, we maintained both stellar carbon performance and increased reductions in electricity use.

Because natural gas is 20x more GHG intensive than electricity, we focus much of our effort on gas reduction. Our goals for reducing natural gas consumption have been more aggressive than for electricity and less predictable, due to a lack of costly, building-level, gas metering infrastructure. We have plans in 2017 to enhance our ability to measure natural gas use in four key buildings, where the opportunities for emissions reduction due to heating plant retrofit are the greatest.

The most dramatic of our systems changes occurred in December when the campus is closed for a week, and in FYQ4, the early months of 2017. These changes included removing old pneumatic HVAC controls, adding 3 buildings to our digital building control system, fuel switching in the Facilities building, and piloting a technology. The pilot explored using wifi network monitoring based occupancy sensing as a means for enhancing ventilation control. This reduces the amount of heat exhausted from our buildings. We began to realize the environmental benefits from the system in early 2017. While not yet reflected in GHG reductions, the pilot was advanced during the reporting period.

One large boiler retrofit completed early in 2016 was sufficient to compensate for a harsher winter. As a result we successfully maintained a 52% reduction of GHG emissions in comparison to our 2007 baseline emission levels.

## Sustainability and the Curriculum

Key learning outcomes that we strive to instill in our students include a sense of responsibility for community and global stewardship. Our students learn about sustainability in their courses and through involvement in campus life. Examples of methods employed to engage students in sustainability include:

- EarthWorks – A faculty led initiative, supported by students and employees, delivers a series of extra-curricular lectures and films. These events are open to the public and aim to provide multidisciplinary education and, by building an understanding of complex environmental issues, inspire all university stakeholders, including local community, to take action for positive change.
- CapU Works – A student employee led initiative, coordinated by a dedicated staff person, delivers engagement activities to students and employees. Each year's program is designed to build upon previous successes. While the program focuses on environmental awareness and conservation efforts, it also addresses social and economic issues related to sustainability.
- Operations as a Learning Environment – Several engagement activities delivered by our CapUWorks and EarthWorks teams are both embedded in curriculum and serve campus operational goals. From energy to waste, environmental sustainability at Capilano is driven by the students, for the students and with the students.
- Curriculum – There are a variety of courses with environmental and social sustainability as an interest, particularly in Arts & Sciences, Business, Outdoor Tourism & Recreation, and Community Outreach & Development. Some courses address specific sustainability problems using the university as a case to study.



## Leading by Example

Learning is part of every academic institution's culture. At Capilano, we spread learning about sustainability through practicing conservation and through community development initiatives. Our programs bring students and employees together around common sustainability goals.

- Our campuses operate on the unceded territory of several First Nations. Building a strong community with a sense of social justice includes creating a spaces that celebrate Aboriginal learning, knowledge and culture. One of these spaces is our Kéxwusm-áyakn Student Centre. The Centre and First Nations Services are supported by a First Nation's Advisor and two first Nations Liaison Officers.
- Energy Wise Network Program – students and employees are encouraged to adopt more sustainable behaviours, through delivery of targeted energy conservation events. These are delivered in partnership with BC Hydro via the Energy Wise Network (EWN) program. EWN replaced its five year-old predecessor program, Workplace Conservation Action, in 2016. Change initiatives delivered in 2016 include: Battle of the Buildings, Sweater Day, and the 30 Day Challenge. We also retired the Get Your Fleece On component for environmental reasons.
- Campus Community Garden – Located at the north end of campus, the garden, officially opened on Earth Day 2013, provides a place for shared experience among students, staff and even our residential neighbours. It's a place to experience the wellness from connecting with the earth and our community.
- Sustainable Transit – Participation in the Compass Card Program encourages the use of public transit and cycling to and from campus by employees and students. This is an area of renewed interest to Capilano as cycling is a core interest of many of our Outdoor Recreation students.
- Paper reduction – Since 2010, we have reduced our paper purchases from 13,365 packages to 8,676. This is a mission that speaks to the community on the topics of conservation of forests, waste management and greenhouse gas emissions. In 2016, Capilano University launched new branding. As part of this initiative, we redoubled our commitment to recycled paper, publishing our first 100% recycled content Viewbook.

While reducing emissions through improved operations is important to our institution, Capilano can be much more impactful in the service to combat climate change by building community and educating future citizens, than by decreasing our footprint. Sustainably serving those who live, work and play at Capilano University improves the local environment, however the true achievement is embodied in our graduates, who are empowered to create change and build a more sustainable future, globally.

# Sustainability Engagement Programs

## Leadership in Student Engagement

Many of our employees and partners work collaboratively to bring sustainability to the forefront of student life. In 2016, a new strategy, an annual Sustainability Week, was added to two existing university sponsored sustainability programs (CapUWorks and Earth Works). This brought key partners such as BC Hydro and Fortis BC to the campus and forged new relationships with non-profit community groups, such as the Vancouver Electric Vehicle Association. While forging relationships with the community helps the university deliver student success, it also brings us students. For example, BC Hydro chose Capilano University to deliver project management professional development to their employees this year. Strong community forges strong economy, a fundamental tenant of sustainable development.

## Engaged Student Leadership

We mount sustainability events with the support of student interns and employees through the CapUWorks program. This offers two advantages over traditional employee delivered engagement programs. First, we're training 4-7 future leaders every academic cycle, contributing significantly to our students' success. Second, students are better equipped to engage their peers. It's well known that after about age 13, peers outperform even parents in their power to persuade and influence, and that trend doesn't stop at early adulthood. Student leadership is essential to change.

As a university, we don't sponsor political action. This is where engagement by a Capilano Students' Union group (the Environmental Justice Collective) serves to bring sustainability into daily campus life. As a separate organization, they have the flexibility to drive voting and demonstrate wherever they deem necessary. This document acknowledges the EJC and lauds their community involvement, but takes no credit for directing or enabling CSU initiatives on environmental issues.

## Sustainability Week

Inspired by a need to celebrate, our first Sustainability Week focused on exceeding our 2015 GHG reduction target (52.7% reduction in comparison to 2007 emissions levels) and redoubling our commitment to engaging on climate change.

Capilano University endeavored to hold five events during the last week of October:

1. Kick-off Party, attended by Suzanne Spence from the Climate Action Secretariat
2. Climate Fair, a collection of climate change focused organizations
3. Electric Vehicle Day, test driving eBikes and electric cars and information booths
4. Renewable Natural Gas Panel, presentations from a project developer and Fortis BC
5. AVED Energy Workshop, a BC Hydro sponsored gathering of students and university energy professionals



President Paul Dangerfield takes the podium.



Ralph Sultan, M.L.A. shows his enthusiasm.

To help organize the events, Natalia Pisarek, the Power Works coordinator from the 2015-16 academic program year, accepted a new role at CapU Works, that of Mentor to four new CapU Works Program student organizers.

## The CapU Works Program

Following the academic calendar, CapU Works employs three to five Student Organizers, 10 hours per week during the fall and winter terms, and one or two students during the summer. Each student is selected for their passion and commitment to sustainability. Four students joined us in the fall of 2016:



*Kaitlin Wong (PowerWorks)  
A Business student with a background in  
volunteering to alleviate poverty.*



*Mara Mennicken (GardenWorks)  
A Community Development student recently  
arrived from Germany*



*Stella Silva (FoodWorks)  
A NABU student from Brazil who joined us in  
Summer 2016*



*Tessa Janzen (EarthWorks)  
An Outdoor Recreation student with a  
background in hospitality management*

During the 2016-17 calendar year, in addition to mounting the 5 sustainability week events, these student organizers delivered, or co-produced alongside the Earth Works faculty the following 9 events and activities.

CapU Works Hosted Activities	CapU Works/EarthWorks Co-Productions
30-Day Challenge Farmer's Market World Food Day Winter Market Sweater Day Sharing Economy film	Mobilizing Resources Waste Audit Bear Day

In addition to delivering 14 events and activities, to reach an estimated 1475 participants, CapUWorks Organizers promoted the faculty driven Earth Works lecture and film series by: guest speaking in classrooms, distributing posters and maintaining an email list of interested students. They also manned tables to represent environmental conservation and promote engagement activities at more than a dozen events hosted by others. These included:

- 2 orientation events (general & international)
- 2 recruitment events (general & international)
- Faculty driven Earth Works lectures and films

## Earth Works

Spearheaded by faculty from a variety of the university's academic programs, this ambitious co-curricular initiative delivers a series of lectures and films. In 2016, a sampling of events includes:

- Capturing Carbon – Geoff Holmes
- Creating a Climate for Change – Tzeporah Berman
- Primeval (film) – Damien Gillis
- Ecological Restoration: Field of Hope – Ken Ashley



For more information, to view the schedule of events, or to see in-house made videos of the events, please visit the [EarthWorks page](#) on the Capilano U website. Earth Works is always supported by a dedicated CapUWorks Student Organizer, the Earth Works Liaison. In the Fall of 2016, Tessa Janzen adapted the new Sustainability Week planning and organizing tools to add structure to three collaborative CapUWorks/EarthWorks events: Mobilizing Resources, the Waste Audit, and Bear Day.

## Environmental Justice Collective

Driven by the Capilano University Students' Union (CSU), this student governance advisory body represents student voices on environmental topics both within and outside the campus community. In the Spring of 2016, Kaylie Higgs, then Earth Works Liaison, served double duty, as coordinator of the Environmental Justice Collective. Kaylie organized a unique CSU workshop to articulate student sustainability desires, a large focus group of sorts that voted to prioritize opportunities they perceived for operational improvements ranging from management of food services to new hyper efficient student union facilities.



To read about, and see videos of, their concerns, events and campaigns, please visit the [EJC's website](#).



## Active Sustainability Learning

### Waste Audit

Campus waste audits are hands-on at Capilano. Students from a variety of faculties engage to learn about our waste generation. First started in 2011, students from a variety of faculties including Environmental Geography, English for Academic Purposes, Biology, and Outdoor Recreation sort through one day of campus waste as part of an ongoing research project aimed at improving our waste management strategies at CapU and raising consciousness.

The performance of our [zero waste stations](#) and of our campus community can be evaluated using this data. The zero waste station consists of 5 bins, 4 for diverting waste and one for landfill, they are:

1. Refundable – generating small amounts of revenue from consumer deposits after collection fees
2. Containers – largely biodegradable and compostable take-out food containers
3. Paper – only copy paper is currently tracked (8.5x11, 11x14, and 11x17)
4. Organics – both food waste and landscape debris
5. Landfill – everything else from consumer source but excluding (construction, electronic and hazardous wastes)

### Compliance with Diversion

While not reported emissions, we understand that landfill generates climate emissions; our ability to divert waste matters. A compliance audit was performed on each waste stream. A compliance audit determines the amount of waste that was correctly placed in zero waste stations while keeping our eye on capacity to achieve regional targets for organic content.

The overall compliance rate of the zero waste containers was 85% in 2017, compared to 90% in 2015. The non-compliant waste was largely: paper soiled by food (22%), food scraps (15%), composite materials (e.g. candy wrappers - 12%) and coffee cups (11%).

### Areas for Improvement

**Organics-** The largest opportunity for improvement by weight is to capture more organic waste (paper soiled by food and food scraps) from landfill containers. Organic, compostable materials represented 45% of waste in all landfill containers

**Single-use Materials-** There is a significant opportunity to reduce the amount of single use, disposable containers used (e.g. coffee cups and To Go containers). Overall, coffee cups and lids represented 9% of total waste and containers represented 19% of total waste.

**Food Court-** There was a high volume of waste from the food court. Reductions to single use materials and better diversion of organics could be achieved by:



*Students sort through waste.*

1. Revisiting the reusable clam-shell container program with Chartwells
2. Encouraging students and staff to bring their own containers and mugs
3. Implementing a “Green Catering” program for campus events
4. Improving zero waste system signage to prevent confusion

*Outdoor Waste Bins* - Approximately 34% of overall waste was placed in outdoor containers (waste and refundable only). We will investigate ways to implement outdoor zero waste stations so we can divert another 200 kg of waste be each day.



*Educate and Minimize*-The single most effective way an individual can reduce waste on campus is to stop purchasing single use containers by bringing a coffee mug and containers to campus.

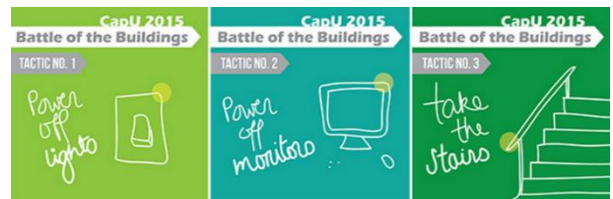
## Energy Conservation

Students in the School of Business in the Leadership in Teams class (BADM 218) with the support of their instructor, Robin Furby, participated in “Battle of the Buildings” and were assigned to come up with tactics to reduce energy consumption in their respective buildings through behaviour change. The buildings involved in this year’s competition were Arbutus, Birch, BOSA, Cedar, Fir and the Library. Teams selected the most appropriate energy conservation behavior(s) for that building from the following three energy saving strategies:



1. Turning off the lights
2. Turning off computers and monitors
3. Taking fewer elevator trips

This year the Library team won and saw a total energy savings of 1% or 1,165kWh!



## Invasive Species Management

Throughout 2016, 36 students, 3 instructors and several staff volunteers participated in two Ivy Pulls across campus to manage invasive species. Instructors Violet Jessen, Antje Bitterberg and Greig Gjerdalen along with Groundskeeper Jo-Ann Cook lead teams of volunteers and students to remove truckloads of Ivy from wetland areas on campus. Additionally, the EarthWorks team provided native plant species that were planted around campus and ECCE students re-purposed the pulled Ivy to make weaved fences.



*Instructor Greig Gjerdalen and a student pull Ivy.*



## Community Engagement

Capilano University is deeply committed to teaching, fostering and developing community engagement. Many of the sustainability initiatives on campus directly impact our greater community which is defined as employees, neighbors and contractors. By getting involved on a variety of community levels we can increase the take up of sustainable behaviors and attitudes beyond the limits of the campus.

Capilano students and employees continued to adopt more sustainable behaviours in 2016, thanks in part to our partnership with BC Hydro and its Energy Wise Network program. In the program's sixth year, a number of behavioral change initiatives were implemented once again to reduce electricity and energy consumption across the university, including:

- **GET UR FLEECE ON** campaign – As a result of new research that indicates washing fleece causes millions of microfibres to be released into lakes, rivers and oceans in 2016 the decision was made to retire the “Get Ur Fleece On!” campaign and swap old and dirty fleece blankets that were given to staff and faculty on campus for new ones. As a result, we were able to avoid sending the existing blankets to landfill and had the opportunity to send the message about the threats of microfibers from fleece.



- **30 Day Challenge** – In the Fall of 2016, the Capilano University community was asked to adopt one sustainability activity for a 30-day period, resulting in 200 students, staff and faculty at our North Vancouver campus rising to the challenge. 70 participants took a further step by sending a photo of them in action. Challenges ranged from packing re-usable shopping bags and taking shorter showers, to riding a bike to campus every day and powering down computers when not in use.



- **Campus Community Garden** – On Earth Day 2013, Capilano University opened its first ever community garden. Located at the north end of campus, the garden provides a site for shared experience among students from different programs and a place for everyone in our community to connect.



Features include a traditional First Nations garden, a 'learning garden' for the youngsters in the Children's Centre, an outdoor classroom and social space, a scent garden, and communal herbs and edible flowers.

There are 58 'regular' plots and 7 'special access' plots for use by the campus community at large (students, faculty, staff, administration, departments/areas, alumni, and our neighbours in the adjoining townhomes). All plots were assigned in 2016, with a waitlist growing for the 2017 season. Feedback has been overwhelmingly positive, as we have been able to bridge the gap between our neighbors and campus community.



- Our campus **Health and Wellness Committee**, comprised of Administrators, Exempt, Faculty and Staff, develops, organizes and executes employee wellness initiatives to promote positive physical and psychological stimulation in our community. The committee delivers campaigns year round, many of which have a carbon reduction element, such as bike to work week, green scavenger hunts and plant walks. Benefits of the program also include supporting healthy, active living and increasing work/life balance.

## Energy & Emissions Performance

### Paper

Since 2007, Capilano has reduced its total paper purchases by 7,595 packages, a reduction of 48%. Since 2010, Paper reductions have contributed 33 tCO<sub>2</sub>e in carbon savings. Carbon reductions from paper have been driven, in large part by employee conservation. Staff efforts have been supported with the adoption of Paper Cut, a software program that both tracks individual paper use and attributes printing costs to individual departments.



- To motivate staff to reduce paper use, sustainability leaders compared our paper use to Vancouver's tallest skyscraper, the Shangri-La Hotel. Our 2007 consumption, stacked flat, reached four times the height of the hotel. If we stacked our current paper consumption, it would reach 1,362 feet! While still too much paper, a reduction in paper use equal to twice the height of the Shangri-la is a huge improvement. Everyone- Administration, Exempt, Faculty and Staff have contributed to this success. Department, Areas and individually we have all worked to reduce paper consumption. The installation of Paper Cut software in 2012 by the IT Department has also contributed to our reductions.

### Fleet Performance – Electric Vehicles

In 2013, we installed two dual-head electric vehicle charging stations at the North Vancouver campus to promote the use of more efficient vehicles.

- Throughout 2016, there was a 55% increase in EV charging sessions (1241 sessions overall) that together totaled 8.7 MWh of power consumption, which saved 3653 kg of greenhouse gas by supporting fuel switching (a 44% increase over 2015).

Not all charging at Capilano University affects our fleet emissions as we offer electricity at no charge to the public, employees, and students. Electric vehicle use seems to be increasing more rapidly within the education community than in the general population. Perhaps reliable access to charging is a significant factor. We will monitor the continued rise in usage of these stations and add stations as demand increases.

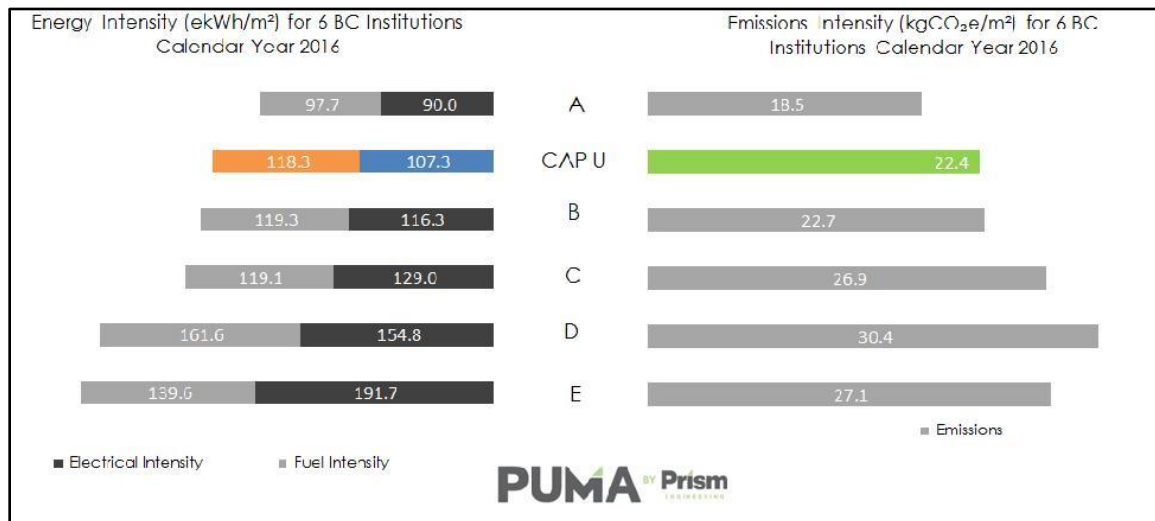
- In 2015 and again in 2016, the Facilities department sought out light duty electric trucks to augment our existing campus electric car fleet. We were unable to identify name brand, safety certified equipment of this nature for sale in Canada.

Fleet changes that will impact our 2017 reported carbon include:

- New more efficient Ford Transits
- New snow removal equipment

## Building Energy Consumption

Our electricity conservation commitment to BC Hydro, 400,000 kWh, was exceeded in 2015, and, more importantly, or natural gas consumption stayed constant despite more severe weather.



- Since 2007, Capilano University has reduced its Building Energy Performance Index (BEPI) from 419 ekWh/M² to 225 ekWh/M². Most of these reductions are attributable to heating system efficiency gains, which declined 48% (adjusted for weather) since 2007.

Our reductions demonstrate Capilano University's progress towards best in class sustainable building operations and campus-wide energy management. Among comparable sized public post-secondary Institutions in the region, many of which have more modern buildings, Capilano University ranks second when comparing overall energy intensity.

Projects, completed in 2016, which contributed to continued building energy efficiency and GHG reductions included:

### ***Lighting – approximately 140,000 kwh in upgrade efficiencies***

- Replacement of bus loop lighting with LED technology
- Retrofit of all lighting at the Sechelt campus with LED technology
- Renewal of CFL pendant lighting, which was exposed to film student tampering presenting higher than usual mercury exposure risk, with LED technology

### ***HVAC Optimization – approximately 260,000 kwh in upgrade efficiencies***

- Direct digital control system additions or retirement of pneumatics in Arbutus, Sportsplex, and Cedar buildings
- Right sizing of air conditioning systems in Bosa building

### ***Heating Cooling Plant***

- Fuel switching to air source heat pump technology in the Facilities and Fitness Centre buildings
- Renewal of rooftop heating and air conditioning units on Arbutus and Birch buildings

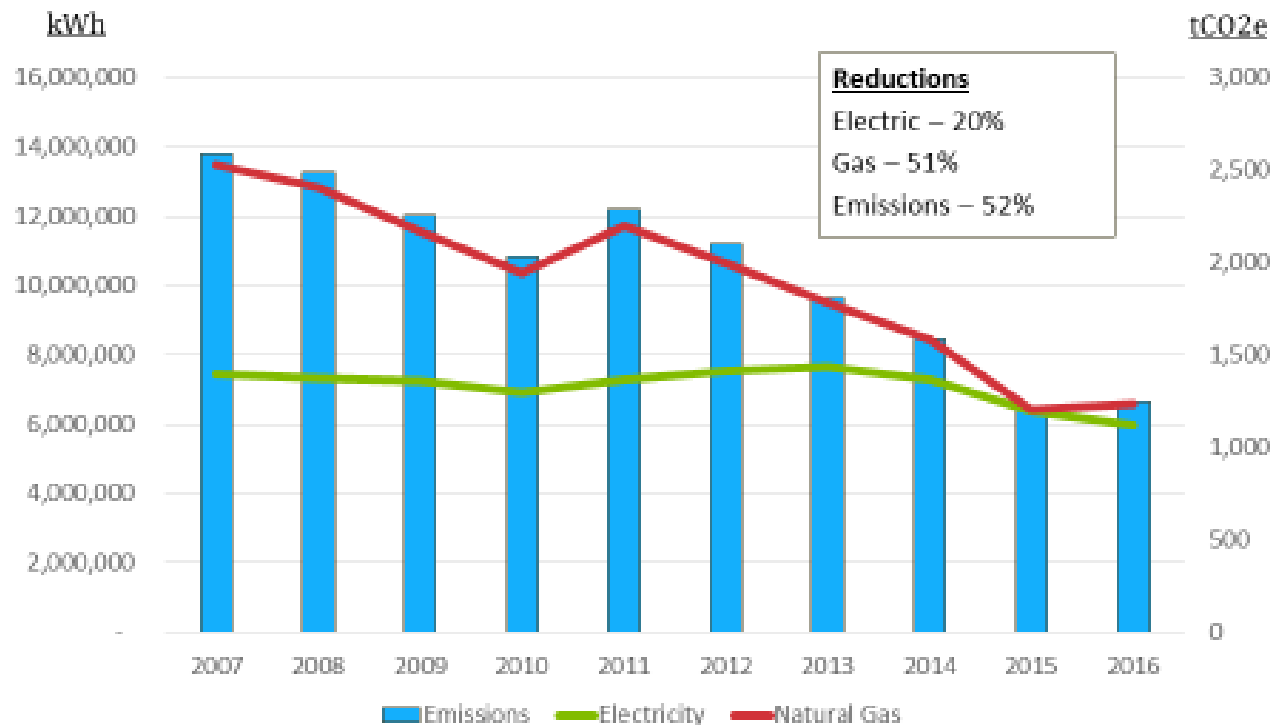
### ***Information Technology***

- Piloting of wifi occupancy sensing technology in Fir Building

Changes that will increase emissions from buildings reported in 2017 include electrical distribution system retrofits which require gas generated power during construction and a dramatic increase in emergency power generation capacity.

## Performance Graph

# BUILDING PERFORMANCE



## Awards

The BOSA Center for Film and Animation, Capilano's newest, state of the art building was constructed using best practices in sustainable design and operations. In 2016, the building (71, 000 ft<sup>2</sup>) received a LEED Gold certification, several notable environmental features of the building include:

- Exemplary performance in indoor and outdoor water reduction
- The installation of low-emitting materials such as carpet, paints, adhesives and sealants
- The use of recycled and regionally manufactured materials
- Energy optimization
- Onsite bicycle storage and change room as well as direct access to public transportation

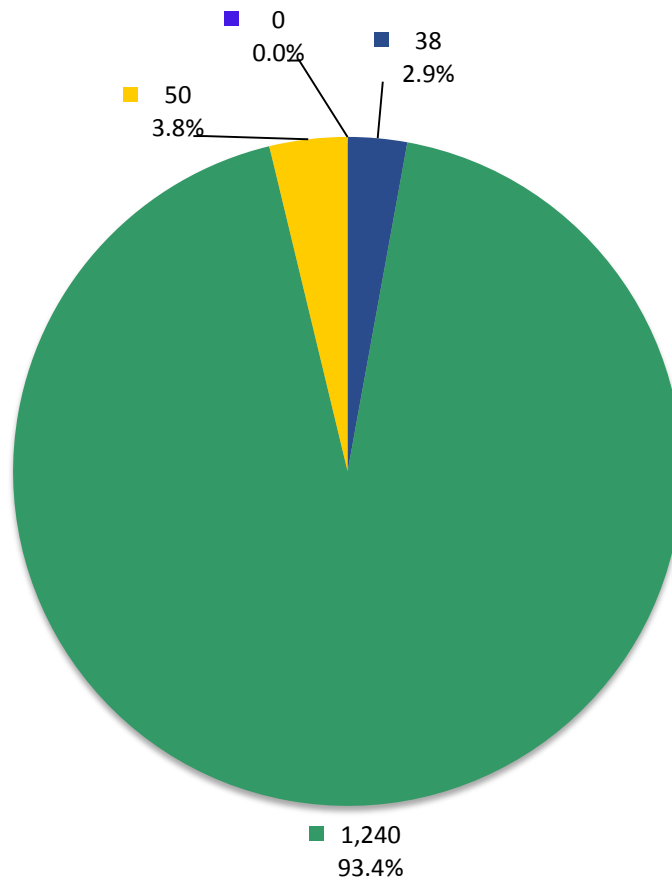
Our Energy Management Program was recognized again for being the provincial top performer in the sector by percentage of electricity reduction.

## **Additional Information**

Capilano University will share documents relating to our energy, emissions and sustainability management efforts. Institutions wishing to learn from Capilano University's sustainability experience, our successes and our failures, are encouraged to reach out to:

William Demopoulos MBA SEMAC  
Sustainability Manager, Facilities  
Capilano University  
604.986.1911 x3471  
[williamdemopoulos@capilano.ca](mailto:williamdemopoulos@capilano.ca)

**Capilano University  
Greenhouse Gas Emissions by Source  
for the 2016 Calendar Year (tCO<sub>2</sub>e\*)**



**Total Emissions: 1,328**

- Mobile Fuel Combustion (Fleet and other mobile equipment)
- Stationary Fuel Combustion (Building Heating and Generators) and Electricity
- Supplies (Paper)
- Fugitive Sources

**Offsets Applied to Become Carbon Neutral in 2016 (Generated May 15, 2017 4:27 PM)**

Total offsets required: **1,326**. Total offset investment: **\$33,150**. Emissions which do not require offsets: **1** \*\*

\*Tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e) 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.

# 2016 Carbon Neutral Action Report Survey

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Part One (external)

Contact Name(s):

*William Demopolous*

Organization Name:

*Capilano University*

Please select your sector:

- Post-Secondary Institution

1) Stationary Sources (Buildings, Power Generators): Fuel Combustion, Electricity use, Fugitive Emissions.

During 2016, did your organization take any of the following actions to support emissions reductions from buildings?

Select all that apply

- Conducted an energy audit/study of building(s) in the organization's portfolio
- Performed energy retrofits of the organization's buildings.: Sunshine coast lighting upgrade, rooftop units in Cedar and arbutus buildings, 10 modulating IBC boilers in our library. Fuel switched to electricity in our Fitness centre and added waste heat recovery.
- Built, or are building new LEED Gold or other "Green" buildings.: BOSA building was built in 2012 but achieved LEED in 2017
- Other actions? Please describe briefly.: Removed pneumatic controls and added DDC in the following buildings: Arbutus and Maple buildings. Changed to instant hotwater systems in our fitness centre. Piloted a new system for automation of buildings using advanced occupancy controls that are driven by our wireless network infrastructure.

Briefly describe your organization's plans to continue reducing emissions from its stationary sources in future years.

*We have a 3 Year Strategic Energy (and GHG) Management Plan supported by BC Hydro's Energy Management Program. We update this annually and integrate our building asset management planning. In 2017, we just enhanced our DDC management of Cedar Building and the Nat & Flora Bosa Centre, added Sportsplex to our DDC system and are hoping to expand DDC management of one more large building, Fir, while removing failing pneumatic control systems. We will also enhance our gas monitoring systems, replace one gas domestic hot water tank system with instant hotwater, retrofit an atmospheric boiler system in a small building with a high efficiency condensing boiler system and expand the use of our new wifi based occupancy system to several more buildings. In 2018 and beyond, we hope to replace natural gas boiler systems with air source heat pumps and waste heat recovery systems as they come due for replacement, implement waste heat recovery wherever economical, and modify space utilization to create a tighter building runtime schedule.*



During 2016, did your organization participate in utility-sponsored energy demand management program(s) (e.g. BC Hydro's Energy Management (Manager))?

Yes

If yes, please describe briefly:

*Our participation involved load curtailment for air handling units in our Library and Birch buildings during winter peak times for BC Hydro energy use. We were able to automate participation.*

## 2) Mobile Sources (Vehicles, Off-road/Portable Equipment): Fuel Combustion.

During 2016, did your organization take any of the following actions to support emission reductions from its mobile sources?

Select all that apply

- Replaced existing vehicles with more fuel efficient vehicles (gas/diesel).: Replaced older light duty vehicles with new. Could not find an electric vehicle to do this with.
- Other actions? Please describe briefly.: We right-size our fleet to task and staff levels, and encourage the use of Car2Go for occasional staff vehicle use.

Briefly describe your organization's plans to continue reducing emissions from its mobile sources in future years.

- Renew fleet anti-idling program
- Investigate increasing EV charging stations on campus
- Switch to bio diesel or electric when available

### 3) Supplies (Paper):

During 2016, did your organization take any of the following actions to support emissions reductions from paper supplies?

Select all that apply

- 
- Policy requiring the purchase of recycled content paper.: Our paper is 30% recycled content and default double sided was implemented in previous years and is maintained.
- 
- Other actions? Please describe briefly.: Printing volume is monitored and costs are presented through PaperCut, a useful automatic tracking system for printing on campus.

Briefly describe your organization's plans to continue reducing emissions associated with its office paper use in future years.

*Our paper is 30% recycled content and default double sided was implemented in previous years and is maintained. A software application monitors and reports on paper use. We have explored 100% renewable but there are purchasing barriers to adoption.*

#### 4) Other Sustainability Actions:

##### Business Travel:

During 2016, did your organization take any of the following actions to support emissions reductions from business travel?

Select all that apply

- 
- Encouraged alternative travel for business (e.g. bicycles, public transit, walking)
- 
- Other, please describe briefly: We have compressed four day weeks for some employees, which minimizes commuting and the associated GHGs of travel. As

##### Education Awareness:

During 2016, did your organization have any of the following programs or initiatives to support sustainability education and awareness?

Select all that apply

- 
- Green, Sustainability or Climate Action Team
- 
- Support for professional development on sustainability (e.g. workshops, conferences, training)
- 
- Supported or provided education to staff about the science of climate change, conservation of water, energy and/or raw materials
- 
- Other, please describe briefly: Student employees engage staff, faculty and students in carbon reducing behaviour changes. We encourage students to take action and participate in awareness and sustainability programs. CapUWorks also supports a faculty-run extra curricular lecture series on climate related issues.

#### Other Sustainability Actions:

During 2016, did your organization have any of the following programs or initiatives to support sustainability?

Select all that apply

- 
- A water conservation strategy which may include a plan or policy for replacing water fixtures with efficient models
- 
- An operations policy or program to facilitate the reduction and diversion of building occupant waste (e.g., composting, collection of plastics, batteries) from landfills or incineration facilities
- 
- Other, please describe briefly: Composting, Fair trade, Wellness programs, CapU Works, Earth Works and more