

2015 Carbon Neutral Action Report

Plans and actions taken to reduce greenhouse gas emissions at the University of the Fraser Valley



This 2015 Carbon Neutral Action Report contains the University of the Fraser Valley's 2015 emissions profile, offsets purchased, the actions we have taken in 2015 to reduce our greenhouse gas (GHG) emissions, and our plans to continue reducing emissions in 2016 and beyond.

By June 30th, 2016, UFV's final CNAR will be posted to our website at: <http://www.ufv.ca/operations/cnar>.

Executive Summary:

Our Mandate - Changing Lives, Building Community

It continues to be UFV's vision to provide the best undergraduate education in Canada and to be a leader of the social, cultural, economic and environmentally responsible development in the Fraser Valley. We place a high value on environmental, social and economic sustainability in all our institutional endeavours.

We remain committed to, and are actively pursuing, our Strategic Direction by assuming a position of environmental stewardship, leadership, and vision, not just in meeting our legislative mandates for GHG reduction targets, but also in the inspiration and enabling of environmental awareness and change in both student learning and campus growth. We continuously strive to be sustainable wherever economic and feasible, by design and retrofit through campus planning, through awareness and behavioural change within our learning community, and promoting initiatives and leadership inclusive of operations, curriculum, and the engagement of our students and employees.

Sustainability by design and retrofit:

Our 2015 report figures are evidence of the number of sustainability actions completed in 2014, each contributing significantly to our long-term goal of reducing UFV's energy consumption and carbon footprint. In 2015, UFV grew into its two new buildings and a 15,000m² growth spurt, completing construction of its second **LEED Gold** building, the Student Union Building. The Canada Education Park **LEED Gold** building has been operating for over two years and has yielded the modelled energy savings, after modifying systems given the few growing pains that usually come with a new facility. The new Student Union Building broke ground in 2013, and was completed on April 7th, 2015, utilizing a new state-of-the-art HVAC thermal energy exchange system *Thermenex* - a more efficient way of providing heating and cooling to large buildings.

The Agriculture Centre of Excellence (ACE) which consists of a demonstration barn and greenhouse had its first full year of operations in 2015. It is a state-of-the-art facility that has a high-efficiency central heating plant.

The recent addition of campus buildings and retrofits completed in 2015 will require the university to develop a new set of baseline measurements used to develop and start new energy reduction goals and reduction target dates. While the SEMP has provided the framework required to link together all aspects of energy management at UFV, the changes we have experienced in 2015 require new strategic direction for UFV to keep electricity savings on track and to see that natural gas savings are maintained in the next few years of

continued campus growth and expansion. The SEMP will be revised in 2016 to support the sustainability focussed initiatives of the University.

To support this, UFV will be securing new funding to launch another series of Continuous Optimization Programs. This series will be focussed on the new buildings to provide a deeper level of baseline measurement, with ability to monitor these buildings at a more granular level for improved energy efficiency as we move into 2016 and beyond to become carbon neutral.

In 2015, approximately 15,000 students attended UFV. The University is expected to experience an average growth rate of ~1,000 students per annum as UFV and the City of Abbotsford establish their U-District of the area surrounding the existing campus footprint.

Student Engagement in Sustainability:

UFV continues to benefit from a growing culture of sustainability among students and employees, and sustainability issues are increasingly the subject of student and faculty research. UFV values the trust of our communities, not just to educate, but to inspire and foster leadership in environmental awareness. 2015 marked our seventh year with the student sustainability internship position in Facilities Management. This one-year position offers the opportunity for a student near to graduation, demonstrating active engagement in sustainability issues, to develop and implement projects that contribute to a culture of sustainability on campus and within the broader community. Two of our previous students holding the position, Ashleigh Yakemchuck and Alyssa Bougie, were nominated by the UFV Centre for Sustainability for Green Leader of Tomorrow at the Abbotsford-Matsqui Rotary Club awards ceremony and both won the award for their work with Facilities and for the Centre.

The sustainability legacy of the students' work continues to grow: There is now a general awareness by students to conserve energy on campus (and at home), and growing reliance on both public transit and the intercampus shuttle service to get to UFV campuses. Newly upgraded water fill stations and increased waste recycling depots are heavily used, widely practiced, and indeed, expected by the students and employees at all UFV sites. This year the focus of the sustainability coordinator has been to promote recycling, energy saving, and awareness through various social media outlets. Students have continued to volunteer for events related to sustainability on campus, from simple tabling events to waste audits. It is clear that students are passionate about and willing to commit their time to improving sustainability on campus.

Centre for Sustainability:

The Centre for Sustainability at UFV integrates a number of environmental initiatives geared towards engaging students, faculty, staff and the broader community, by promoting research, information exchange, awareness and action in all matters of sustainability. The profile and work of the Centre continues to grow within the broader community served by the University with an average of a dozen seminars hosted annually. The Centre for Sustainability has also collaborated to bring larger speaker panel events to UFV throughout 2015 on a range of topics from air pollution to climate change advocacy. The Centre for Sustainability created and executed a number of campaigns over the past year. Some of these include: Garbage on the Green, Sweater Week, and Summer Shutdown. The CFS acts as an advisory body to students, staff, faculty, and organizations outside of UFV.

Executive Summary (Continued)

2015 Greenhouse Gas Emissions

The carbon footprint for the University of the Fraser Valley registered at 2,168 tCO₂e in 2015; that value was significantly lower than the 2014 recorded value of 2,432 tCO₂e. In relation to the University’s activity as measured by full time equivalent (FTE) student enrolment (8276.5), the 2015 carbon footprint was also reduced over the previous year. Last year’s value of 0.30 tCO₂e/FTE was reduced to 0.26 tCO₂e/FTE, a reduction of 14.4% in GHG emissions, inclusive of a 4% increase in student enrolment.

It should be noted that above average temperatures were experienced for the 2015 year, and thus reduced the heating load and energy consumption. The information provided throughout this report has not been normalized for weather, as we are reporting unaltered data. The 6.2% decrease in energy consumption for our buildings can be attributed to a number of mechanical system upgrades and building energy retrofits in addition to the higher temperatures recorded. UFV consumed 5,055 fewer gigajoules in 2015 compared to 2014, and 8,692 less than 2013. Our assessment of changes made in 2014 suggest that 2015 yielded the intended results.

Fleet emissions identified in 2015 are consistent with the previous two years with a marginal increase in GHG emissions by 1.0 tCO₂e’s. Fuel consumption increased by 605 litres in comparison to 2014, and remains consistent with levels since 2013 when more vehicles were added to the inventory.

In 2015, we decreased our consumption in the use and purchase of paper stock. Paper consumption down 19.4% compared to 2014, avoiding the purchase of 2,952 packages of paper. As a result, we generated 17.59 fewer tonnes of GHG emissions compared to 2014. Behaviourally speaking, 2015’s results have a direct correlation to the continued awareness of paper consumption and have seen a steady reduction from our 2009 baseline measurements.

Offsets Purchased to Become Carbon Neutral

In 2015, the University purchased offsets for 2,306 tCO₂e from the Pacific Carbon Trust valued at \$60,532.50 net of GST, nearly identical to the \$60,375 paid in 2014.

Emissions and Offset Summary Table:

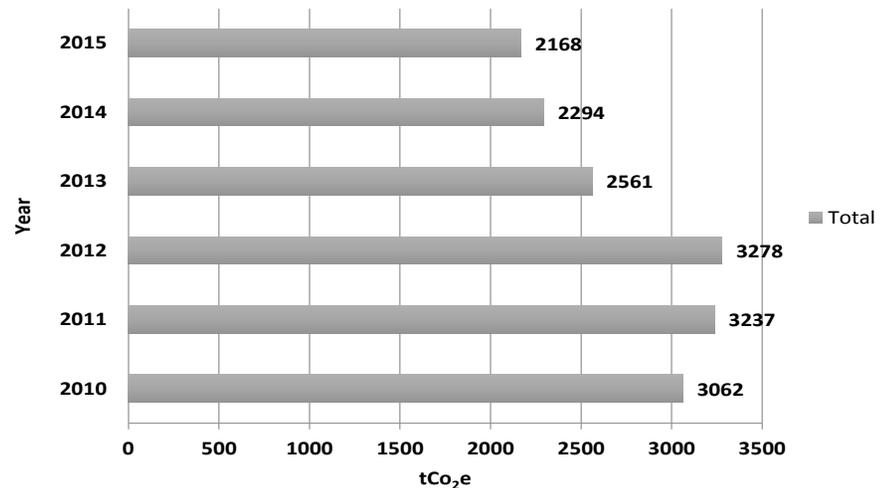
University of the Fraser Valley GHG Emissions and Offset for 2015 (TCO2E)	
GHG Emissions created in Calendar Year 2015:	
Total Emissions (tCO ₂ e)	2169
Total Offsets (tCO ₂ e)	2168
Adjustments to GHG Emissions Reported in Prior Years:	
Total Emissions (tCO ₂ e)	138
Total Offsets (tCO ₂ e)	138
Grand Total Offsets for the 2015 Reporting Year:	
Grand Total Offsets (tCO ₂ e)	2306

Executive sign-off:


 Signature _____ Date May 25, 2016
Jackie Hogan
 Name (please print) _____ Title CFO + VP Administration

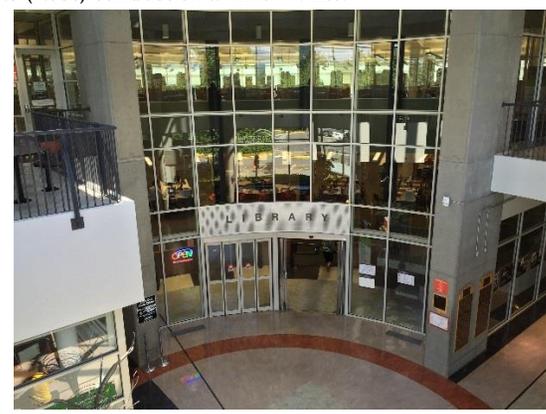


GHG Emission Comparison



UFV's GHG Emissions by Source

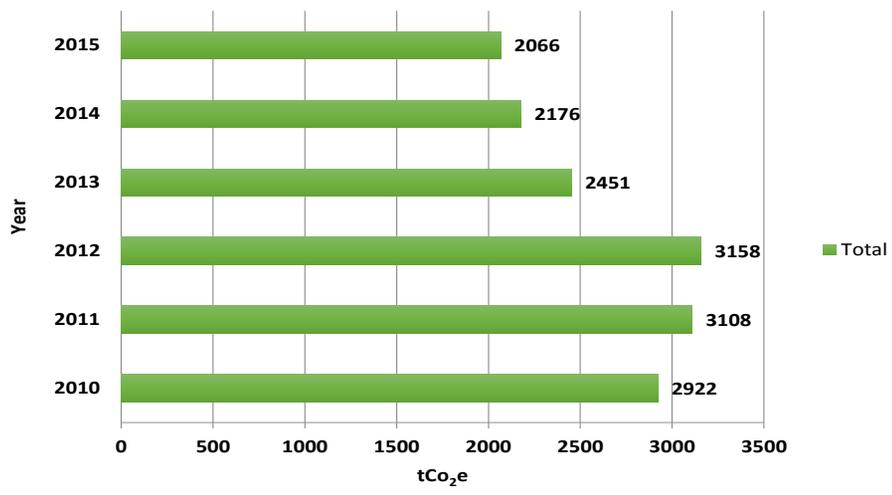
In 2015, our total GHG emissions were 2,168 tonnes of CO₂ equivalent. The most significant emissions source being used in our buildings was for heating space and water, and the use of electricity which comprised 95.2% of emissions sources, with paper consumption rounding out at 3.27% and mobile (fleet) combustion a minor 1.42%.

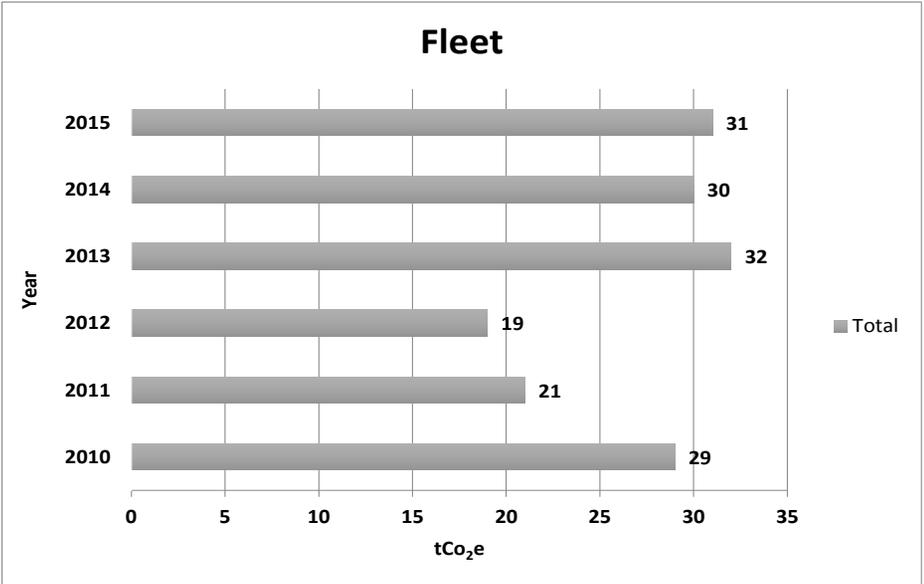


Buildings

The 5.1% decrease in energy consumption for our buildings can be attributed to a number of mechanical system upgrades and building energy retrofits and warmer temperatures recorded during the heating season. We used 5,055 Gigajoules less energy in 2015 than compared to 2014. Our assessment of changes made in 2013 and 2014 show that 2015 continues to yield the intended results.

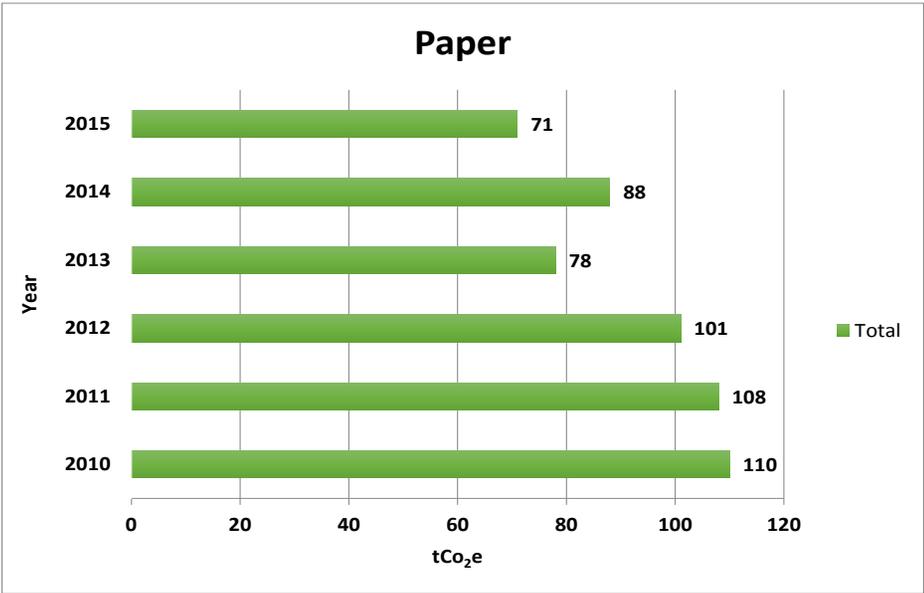
Buildings





Fleet

After identifying missing fleet vehicles from our inventory in 2013, it would appear that the erroneous increase in emissions identified in 2013 have leveled out in 2014 and 2015 with a slight increase in GHG emissions by 1.0 tCo₂e's in the past year. Fuel consumption increased by 606 litres last year.

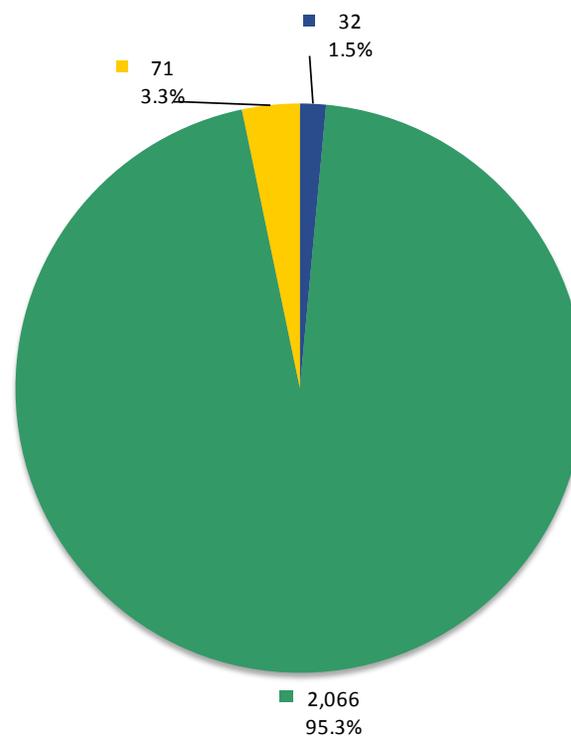


Paper

In 2015, we significantly decreased our consumption in the use and purchase of recycled paper stock at UFV. Paper consumption was 19.4% less when compared to 2014, which resulted in purchasing 2,952 fewer packages of paper. As a result, we avoided 17.59 tonnes of GHG emissions compared to last year. Behaviourally speaking, we have been able to maintain an awareness on paper consumption and continue to see a reduction year over year (except 2014) from our baseline measurement created in 2009.



University of The Fraser Valley Greenhouse Gas Emissions by Source for the 2015 Calendar Year (tCO₂e*)



Total Emissions: 2,169

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

Offsets Applied to Become Carbon Neutral in 2015 (Generated May 17, 2016 4:02 PM)

Total offsets required: **2,168**. Total offset investment: **\$54,200**. Emissions which do not require offsets: **1** **

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

** Under the *Carbon Neutral Government Regulation of the Greenhouse Gas Reduction Targets Act*, all emissions from the sources listed above must be reported. As outlined in the regulation, some emissions do not require offsets.

OPERATIONAL CHANGES IN 2015

April 2015 - Abbotsford Building S opened. This building is a new Student Union Building consisting of mostly office and meeting space. The HVAC uses a Thermenex system which optimizes the use of heating and cooling using existing technology to achieve a calculated 30% energy savings compared to the same regular HVAC system in normal operation using the normal technology.

Summer 2015 - Office lighting in Abbotsford buildings B and C were converted from the Ergo Lighting system to local vacancy sensor switches. The Ergo light system was operating on an unsupported platform. These switches allow the office lights to be left off unless manually turned on and will shut the lights off after a predetermined vacancy time.

Summer 2015 - CEP Building T - Welding shop booth fume extraction system upgrades. The Welding Shop at CEP building T was built in 2007. The fume and dust extraction systems are allowing a lot of fugitive dust and emissions throughout the shop and other areas of the building causing a health and safety issue for the entire facility. Part of this project was the installation of speed drives on the supply and exhaust fans within the shop to allow control of the fans as welding booths were started up and shut down, thus allowing for energy savings through lower fan speeds, lower air flows, lower heating requirements because of reduced supply air volumes while improving the air quality in the shop and the building.

Sept 2015 - CEP building N - operation of this building was turned over from Canada Lands to UFV. This is an older building (1960's) which will need upgrades in the near future.

ACTIONS TO REDUCE PROVINCIAL EMISSIONS & IMPROVE SUSTAINABILITY

In addition to reducing our reportable emissions, here are some examples of our commitment and innovation towards sustainability:

Agricultural Waste Management

Composting in response to finding ways to be more sustainable, UFV's Agriculture department purchased an industrial composting system as part of its Phase II construction of A.C.E. The compostable material generated from this system is used to fertilize vegetation on campus, as well as within the greenhouse planting curriculum. In 2015, we initiated a trial program to divert compostable paper towel waste from the landfill into an on-site composter at CEP. We will continue to alter the 'recipe' to manage increasing amounts of diverted paper towel waste in 2016.

Water Filtration & Landfills

In 2015, UFV installed seven additional Elkay Water Bottle Fill stations on campus bringing the total to 16 stations providing filtered drinking water. To date, UFV has helped nearly 250,000 disposable plastic water bottles from landfill sites.

Alternate Transportation

The Campus Connector is the product of a partnership between the Student Union Society and UFV that addresses a long-standing transportation challenge between the University campuses in the communities of Abbotsford and Chilliwack. The shuttle supports student engagement, success, and community through increased accessibility to classes, events, and opportunities at both campuses. In addition, the Campus Connector supports UFV's efforts in reducing direct and indirect GHGs and environmental degradation. Four 20-passenger shuttle busses run simultaneously between the campuses on a pre-set schedule. A 5th bus, new in 2015, runs from Langley to Abbotsford.

Workplace Conservation Awareness (WCA)

The BC Hydro Workplace Conservation Awareness (WCA) Program provides support for BC organizations to design and deliver energy conservation engagement programs that encourage staff action and work to establish a permanent culture of conservation within the organization. The program provides a strategic framework and support to increase conservation knowledge and awareness and inspire the action and leadership that is required to realize energy savings. The University of the Fraser Valley (UFV) joined the program in 2011 and has run multiple campaigns on the topics of lighting, monitors, and temperature settings.

Electric Vehicle Charging Stations

In 2013, UFV received funding assistance from the Fraser Basin Council to install eight electric vehicle level 2 charging stations at our UFV campuses. As part of the Plug in BC initiative, UFV is now an active participant in the EV charging station network across BC. We are studying the patterns of use and will determine whether to re-organize the distribution of the charging station throughout the campuses so they are best utilized.

GreenSPEAK Lecture Series

The Centre for Sustainability through the last five years has successfully coordinated an engaging series of public seminars coined "greenSPEAK", which has included a plethora of sustainability topics presented from a diverse group of disciplines. The profile and work of the Centre continues to grow within the broader community served by the University with an average of a dozen seminars hosted annually.

This year's topics included:

- Sustainability in the Face of a Megathrust Earthquake: Lessons From the 1970 Peruvian Earthquake
- Medicinal Plant Conservation
- Housing Policy and its Effect on Suburban Housing Architecture, and Changes in Stream Biogeochemistry Due to Development
- Air Pollution in the Fraser Valley and its Impacts

Plans to Continue Reduction of Greenhouse Gas Emissions

In 2016, the UFV will further solidify its commitment to developing and implementing environmentally sustainable projects, programs and initiatives. Proof of UFV's dedication can be seen in the creation and hiring of the Energy Manager position. This role will be responsible for pushing forward and building upon the success of environmental sustainability projects by dedicated students, faculty and staff in recent years.

In the upcoming year, expect a number of lighting retrofits to occur throughout the campuses as LED technology continues to improve and better business cases are being made. In addition to lighting upgrades, there will be significant resources put into upgrading the control systems to increase functionality and lower utility costs. The Energy Manager will also focus on optimizing the controls system to ensure systems are off when they are not needed to be operating, and to better optimize the systems so the learning and working environment is best suited to support high levels of achievement. UFV will continue to look for opportunities and funding associated with the upgrading of mechanical systems, including boilers and cooling systems. The Centre for Sustainability will welcome a new Sustainability Coordinator Assistant (SCA) as Alyssa Bougie has graduated after holding the position in excellent standing for 18 months. The new Assistant will continue to drive successful sustainability initiatives, particularly with the student body. The recycling and composting programs at UFV will continue to be a focus for the SCA, working in chorus with the facilities department.

Links to Other Information Relevant to Sustainability

<http://www.ufv.ca/operations/cnar/>

<http://www.ufv.ca/energy/>

<http://www.ufv.ca/sustainability/>

<http://www.ufv.ca/sustainability/studentactivitiesresearch/students-for-sustainability/>

http://www.fraserbasin.bc.ca/ccaq_plug_in_bc.html

<http://www.plugshare.com/>

<http://thermenex.com/>

<http://www.ufv.ca/media/assets/janitorial/Bin-beGone.pdf>



2015 Carbon Neutral Action Report Survey

Part One

Contact Name(s):

Blair McFarlane

Organization Name:

University of the Fraser Valley

Please select your sector:

Post-Secondary Institution

1) Stationary Sources (Buildings, Power Generators, Ext. Lighting) Fuel Combustion, Electricity use, Fugitive Emissions: Please indicate which actions your PSO took in 2015:

Have developed an overall strategy/plan to reduce energy use in your organization's buildings inventory:

Yes

If Yes, please describe:

The Strategic Energy Management Plan (SEMP) supports the University of the Fraser Valley's (UFV) commitment to energy efficiency and conservation by providing a framework for reducing energy consumption and its associated environmental impact. This SEMF includes a specific energy reduction target and an action plan of how the target will be achieved. By implementing the actions detailed in this Strategic Energy Management Plan, UFV is demonstrating leadership through innovation and accountability for the resources it uses as an organization. Further, UFV is also reducing its exposure to energy cost escalations, demonstrating environmentally-responsible development in the Fraser Valley and reducing its reliance on the province's energy infrastructure.

Undertook evaluations of building energy use:

Yes

Performed energy retrofits on existing buildings:

Yes

Built or are building new LEED Gold or other "Green" buildings:

No

Please list any other actions, programs or initiatives that your organization has introduced that support emissions reductions from buildings:

Developed a business plan to create the Energy Manager position, hiring in early 2016.

Coordinated a "Sweater Week" and turned down the heating systems.

"Computers Need Sleep Too", "Turn it Off", "Summer Shut Down", "Holiday Shut Down" campaigns, turning off office equipment and lighting outside of business hours.

Continuously replacing and upgrading equipment with more energy efficient models.

UFV has continued its ongoing partnership with Prism Engineering's utility data management program PUMA. PUMA is online energy management software and services that assists with the analysis and management of energy consumption and GHG emissions using utility billing data.

2) Mobile Sources (Fleet, Off-road/Portable Equipment) Fuel Combustion: Indicate which actions your PSO took in 2015:

Have put in place an operations policy/program to support systematic reductions in fleet related emissions:

No

Replaced existing vehicles with more fuel efficient vehicles (gas/diesel):

No

Replaced existing vehicles with hybrid or electric vehicles:

No

Took steps to drive less than previous years:

Yes

Please list any other actions, programs or initiatives that your organization has introduced that support emissions reductions from fleet combustion:

Expanded the Campus Connect bus service to increase capacity and schedules, and deter use of single occupant vehicles by students and staff.

3) Supplies (Paper): Indicate which actions your PSO took in 2015:

Have put in place an operations policy/program to facilitate a systematic reduction in paper-related emissions:

Yes

If yes, please describe:

UFV IT Services department programs all of the MFD's to perform 2-sided printing as a default printing standard as a way to reduce paper consumption, in addition, there has been a greater move towards using the MFD's to scan documents for electronic archiving versus traditional photocopying. The popularity of using electronic devices such as iPads, tablets, iPhones and laptops seems to be a move in the right direction towards sharing information electronically versus using paper format. UFV realized a 19.4% reduction in paper consumption in 2015 compared to the 2014 year. We look forward to continuing this trend into 2016 and beyond.

Have put in place an operations policy/program to facilitate behavioural changes from paper use:

Yes

If yes, please describe:

A waste audit was conducted by the UFV Centre for Sustainability green team, with the intent to highlight the deficiencies of recycling on campus and the need to focus behavioural campaigns on reducing paper waste and proper recycling habits. 27% of waste was found to be paper towel (compost) or mixed paper (recyclable).

Used only 100% recycled paper:

No

Used some recycled paper:

Yes

Used alternate source paper:

No

Business Travel

Created a low-carbon travel policy or travel reduction goal:

No

Encouraged alternative travel for business:

Yes

Encouraged or allow telework/working from home:

No

Education & Awareness

Have a Green/Sustainability/Climate Action Team:

Yes

Supported green professional development:

Yes

Supported or provided education to staff about the science of climate change, conservation of water, energy and/or raw materials:

Yes

Adaptation Planning for Climate Risks

Have assessed whether increased frequency of extreme weather events and/or long term changes in climate will affect your organization's infrastructure, its employees and/or its clients:

Yes

Have incorporated these anticipated changes in climate into your organization's planning and decision making:

Yes

Other Sustainability Actions

Established a water conservation strategy which includes a plan or policy for replacing water fixtures with efficient models:

Yes

Have put in place an operations policy/program to facilitate the reduction and diversion of building occupant waste stream from landfills or incineration facilities:

Yes

Established green standards for goods that are replaced infrequently and/or may require capital funds to purchase:

Yes

Incorporated lifecycle costing into new construction or renovations:

Yes

Please list any other sustainability actions your organization has taken not listed above:

The new Elkay water bottle fill stations is an initiative to reduce the number of bottled water being purchased at the university and subsequently preventing the number of plastic bottles being sent to landfills by promoting behaviour for employees and students to bring their own bottles for drinking water on campus. Each fill station offers filtered water and indicates the number of bottles saved from the landfills by providing a bottle count via a digital counter found on the LCD display of the unit. The popularity of these water bottle fill stations has prompted the installation of another seven units in the 2015 calendar year.

In addition to the emissions reducing initiatives headed by the Green Team, the Team developed projects, programs and initiatives aimed at:

- A trial 'In-House Composting' initiative, whereby compostable paper towel is diverted to CEP and mixed with other compost for use in the landscaping and agriculture department.
- Working with the Garden Club to increase knowledge and awareness of local produce.
- Educational material and seminars aimed at informing the public of the detrimental effects of the fashion industry.
- Additionally, it was determined that the Sustainability Coordinator Assistant (SCA) student position will be continued for the 2016 year and beyond. The SCA will continue to champion sustainability initiatives throughout the university community.

Part Two

Does your organization have an emission reduction target?

Yes

If Yes, please describe:

Year over year, 1-2% reduction in GHG emissions.

Does your organization have a strategic plan to implement emission reductions activities?

Yes

If Yes, please describe:

The Strategic Energy Management Plan (SEMP) supports UFV's commitment to energy efficiency and conservation by providing a framework for reducing energy consumption and its associated environmental impact. This SEMF includes a specific energy reduction target and an action plan of how the target will be achieved.

By implementing the actions detailed in the Strategic Energy Management Plan, UFV demonstrates leadership through innovation and accountability for the resources it uses as an organization. Further, UFV is also reducing its exposure to energy cost escalations, demonstrating environmentally responsible development in the Fraser Valley and reducing its reliance on the province's energy infrastructure.

Out of all the projects your organization has undertaken in 2015, please select the one action taken that resulted in, or is expected to result in, the greatest emissions reductions:

Upgrading and optimizing DDC programs in multiple buildings throughout the campuses.

What are the barriers your organization faces when trying to implement emissions reduction initiatives? It is expected that funding is a major issue. If there are other barriers as well please describe those below:

The greatest barrier to implementing emissions reduction initiatives is having a dedicated energy management and sustainability employee(s).

UFV developed the framework to hire an energy manager for the 2016 calendar year. It is hopeful that the person filling this position can concentrate on identifying methods on improving existing building systems and dedicate their time in keeping UFV moving forward towards its target energy reductions.

Provide a "wish list" of reduction actions your organization would like to take, i.e. what are the priority projects your organization sees as being most effective in leading to substantive reductions of emissions and increased energy efficiency (regardless of cost or other limiting factors)?

In 2016 and beyond, re-developing the Sustainable Energy Management Plan is important to the organization as it is a document that determine what aspects of energy efficiency and sustainability has been working well, where it can be improved, and how to achieve the goals set.

Redeveloping a baseline will significantly improve the ease and accuracy of reporting and highlight potential deficiencies and areas that need improvement.

Better understanding how the trades building occupants, schedules and building systems interact will be essential in lowering the energy use per square meter, per classroom hour for this building - which has historically had the highest energy intensity.

Increasing behaviour change campaigns and participation in energy reducing activities, programs and campaigns, and increasing quality and quantity of communications will be integral to changing the culture of UFV and awareness of an energy management program.

Stationary Sources Data:

What is the total amount of floor space in your organization (including occupied and unoccupied space)?

96,138m²

Mobile Sources Data:

How many light-duty vehicles are in your fleet?

1

How many light-duty trucks are in your fleet?

7

How many heavy-duty vehicles are in your fleet?

0

How many off-road vehicles are in your fleet?

7

For school districts, post-secondary and BC Transit only: How many school buses/transit buses are in your fleet?

0



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www.ufv.ca/operations/CNAR

