



## 2016 Carbon Neutral Action Report

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



This 2016 Carbon Neutral Action Report contains the University of the Fraser Valley's 2016 emissions profile, offsets purchased, 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<sup>th</sup>, 2017, UFV's final CNAR will be posted to our website at: <http://www.ufv.ca/energy/>.

## 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.

In 2016, approximately 15,500 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.

### Campus Expansion Increases Impacts of Actions:

Our 2016 report figures are evidence of the number of sustainability actions completed in the years leading up to, and including the reporting year in the face of a historically cold winter. Each action contributing significantly to our long-term goal of reducing UFV's energy consumption and carbon footprint. In 2016, UFV's building footprint briefly contracted with the demolition of Chilliwack North Buildings A and B, and the sale of Building C (3,895m<sup>2</sup>). In turn, the University purchased two new buildings at the Canada Education Park campus in Chilliwack, Buildings Q and R (1,996m<sup>2</sup>), and as such the University now owns, manages, and maintains 92,835m<sup>2</sup> of core building space with an increasing onus on environmental sustainability throughout all spaces.

The recent addition of campus buildings and retrofits completed in 2016 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 Sustainable Energy Management Plan (SEMP) has provided the framework required to link together all aspects of energy management at UFV, the changes we have experienced in 2016 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 SEMF will be revised in 2017 to support the sustainability focussed initiatives of the University.

To support this, UFV will look to secure new funding for the 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 2017 and beyond, maintaining carbon neutrality and further reducing our carbon emissions.

### 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. 2016 marked our eighth 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. Alyssa Bougie was succeeded by fellow geography student Travis Gingerich in May as Alyssa graduated from UFV, and did so with an excellent track record for environmental stewardship on campus.

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 witnessed numerous changes at UFV in 2016 including the restructuring of the advisory committee, comprised of three facilities personnel, one faculty, one student, and a member of the Faculty and Staff Association (FSA). The former Sustainability Coordinator Assistant (SCA, student position) Alyssa Bougie graduated and moved on from the role. The Facilities Department continued their support for the position and hired Travis Gingerich, a geography student, who immediately put his appetite for environmental stewardship to work. Facilities hired an Energy Manager, Blair McFarlane, to oversee energy efficiency projects and initiatives, the SCA, and sustainability campaigns. Patrick Harrison, known to many at UFV and throughout the community for his lasting work on sustainability as Chair of the Centre for Sustainability (CFS), maintained an integral voice in all things green at UFV. The Director of Facilities, Mark Goudsblom, and Associate Director of Building Systems Sheldon Marche continued to serve the advisory committee with unique perspectives and a wealth of experience. Kim Nickel from the FSA also joined the ranks on the advisory committee, providing a perspective and voice from UFV staff. The changes and shifts in structure of the Centre for Sustainability created numerous opportunities for the leadership group to excel, excite and motivate students, staff and faculty to reduce their environmental impact while on campus, as well as in their home communities.



## Executive Summary (Continued)

### 2016 Greenhouse Gas Emissions

The carbon footprint for the University of the Fraser Valley registered at 2,330 tCO<sub>2</sub>e in 2016; that value was marginally higher than the last year's value of 2,234 tCO<sub>2</sub>e. In relation to the University's activity as measured by full time equivalent (FTE) student enrolment (8276.5), the 2016 carbon footprint was also slightly increased over the previous year. Last year's value of 0.27 tCO<sub>2</sub>e/FTE was increased to 0.276 tCO<sub>2</sub>e/FTE, an increase of 2.23% in GHG emissions when factoring a 1.9% increase in student enrolment.

It should be noted that below average temperatures were experienced for the second half of the 2016 year, and thus increased the heating load and energy consumption in the latter portion of the year. The information provided throughout this report has not been normalized for weather, as we are reporting unaltered data. The 8% increase in stationary combustion (primarily natural gas for heating) could have been much more dramatic compared to last year's values if not for a number of mechanical system upgrades, HVAC schedules and increased DDC monitoring, and energy retrofits during a cold final quarter. UFRV consumed 3,492 more gigajoules in 2016 compared to 2015, and 230 less than 2014. Our assessment of changes made in 2015 suggest that 2016 yielded the intended results in light of the unfavourable temperatures.

Fleet emissions identified in 2016 are consistent with the previous two years with a nominal increase in GHG emissions by 2.1 tCO<sub>2</sub>e's. Fuel consumption increased by 672 litres in comparison to 2015, and remains consistent with levels since 2013 when more vehicles were added to the inventory. With the increasing importance of GHG emissions reduction, efforts are being made to begin to electrify the fleet in 2017 and beyond.

In 2016, we decreased our consumption in the use and purchase of paper stock. Paper consumption was down 6.6% compared to 2015, avoiding the purchase of 760 packages of paper and 2.9 tonnes of GHG emissions. These figures speak to the behavioural changes on campus as paper reduction continues to trend downwards resulting in an outstanding 60% decline in paper purchases from 2010 levels - nearly 7,000 packages.

## EMISSIONS REDUCTION ACTIVITIES


Emissions and Offset Summary Table:

University of the Fraser Valley's GHG Emissions and Offset for 2016 (tCO <sub>2</sub> e)	
<b>GHG Emissions created in Calendar Year 2016:</b>	
Total Emissions (tCO <sub>2</sub> e)	2331
Total Offsets (tCO <sub>2</sub> e)	2330
<b>Adjustments to GHG Emissions Reported in Prior Year:</b>	
Total Emissions (tCO <sub>2</sub> e)	67
Total Offsets (tCO <sub>2</sub> e)	67
<b>Grand Total Offsets for the 2016 Reporting Year:</b>	
Grand Total Offsets (tCO <sub>2</sub> e)	2397

### Retirement of Offsets:

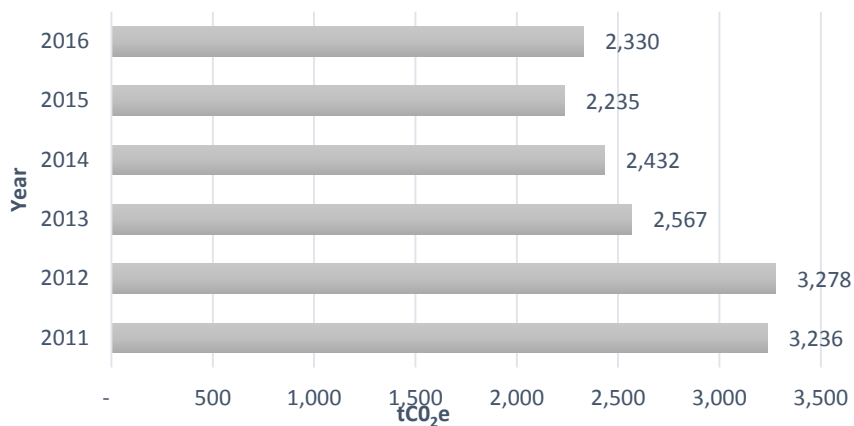
In accordance with the requirements of the Greenhouse Gas Reduction Targets Act and Carbon Neutral Government Regulation, *The University of the Fraser Valley* (the Organization) is responsible for arranging for the retirement of the offsets obligation reported above for the 2016 calendar year, together 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 within 30 days, 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.

Signature  
  
 Jackie Hogan  
 Name (please print)

Date  
  
 CFO and VP Administration  
 Title



## GHG Emission Comparison

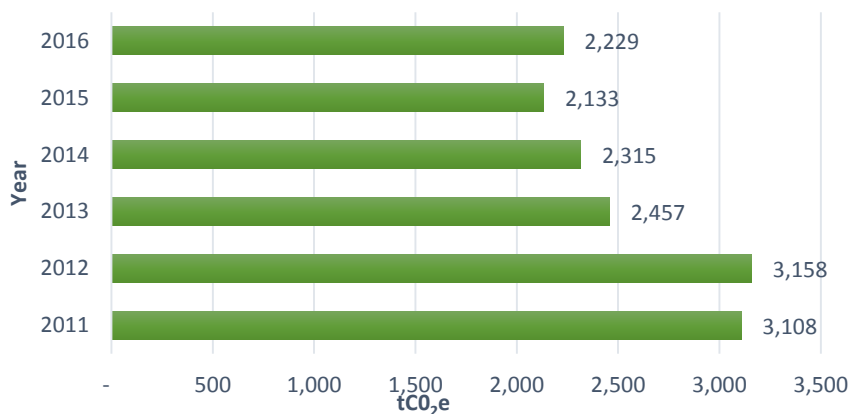


## UFV's GHG Emissions by Source

In 2016, our total GHG emissions were 2,330 tonnes of CO<sub>2</sub> equivalent (not including 2015 adjustments). The most significant emissions source being used in our buildings was for heating space and water and the use of electricity which comprised 95.6% of emissions sources, with paper consumption at 2.9% and mobile (fleet) combustion rounding out a minor 1.46%.

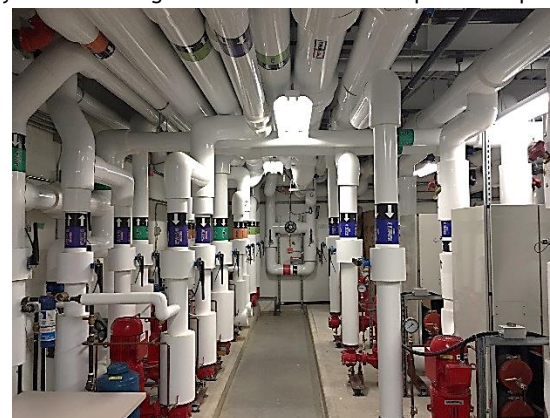


## Buildings

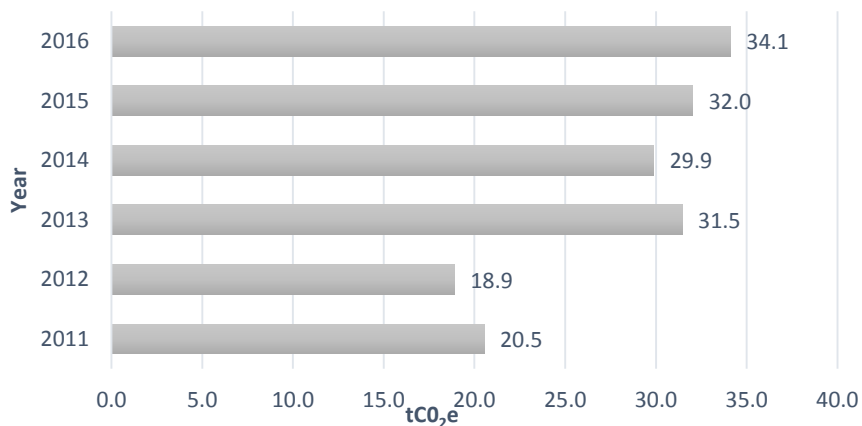


## Buildings

A number of mechanical system upgrades and building energy retrofits reduced the impacts of a historically cold winter, which resulted in a 4.5% energy consumption increase. We used an additional 3,492 gigajoules in 2016 than compared to 2015. The energy efficiency upgrades made in previous years and throughout 2016 had substantial positive impacts on our results.



## Fleet

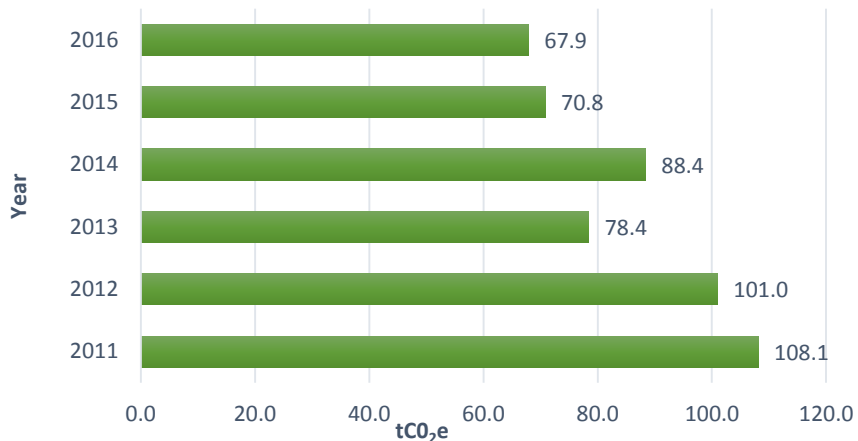


## Fleet

After identifying missing fleet vehicles from our inventory in 2013, there have been further increases in fuel consumption within our fleet. This is due to expanded territories for both maintenance and janitorial, increasing the kilometers travelled. Furthermore, Groundskeeping and the Trades program have expanded their equipment inventory. Overall, there was a resulting 672L increase in fuel consumption in 2016 from the previous year.



## Paper



## Paper

In 2016, we significantly decreased our consumption in the use and purchase of recycled paper stock at UFV. Paper consumption was 6.6% less when compared to 2015, which resulted in purchasing 760 fewer packages of paper. As a result, we avoided 2.9 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). We have decreased our consumption by 37.7% from the peak in 2010.





## OPERATIONAL CHANGES IN 2016

Abbotsford Building S, built to LEED gold standards, continued being commissioned and optimized. 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. Our mechanical maintenance staff are diligently working towards optimizing the system in an effort to achieve the designed 30% energy savings.

Similarly, CEP A, another LEED building, continues to be commissioned with increasingly positive energy efficiency returns.

## ACTIONS TO REDUCE PROVINCIAL EMISSIONS & IMPROVE SUSTAINABILITY

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

### Mechanical Upgrades

Abbotsford D Building Skylight De-Lamping project.

Abbotsford D Building CIS Lab LED lighting upgrade.

Abbotsford F Building LED lighting upgrade.

Abbotsford G Building LED entrance lighting upgrade.

Abbotsford campus parking lot and exterior lighting LED upgrade with control upgrades to reduce lighting levels between 11:00pm and 6:00am with motion sensors.

Abbotsford A Building chiller upgrade.

DDC holiday re-scheduling to match HVAC operations with occupancy loads.

Aerospace campus hangar 4 high bay LED lighting upgrade.

### Energy Wise Network & Sustainability

The BC Hydro & FortisBC Energy Wise Network is a collaborative network made up of Advanced Education, Government, Schools (K-12), Hospitality, Municipalities, Property Management, and Retail sectors. This network supplanted the Workplace Conservation Awareness program and was initiated by BC Hydro and Fortis BC. The network provides campaign tool kits, professional coaching hours, networking opportunities, training webinars, and two summits per year providing the framework for many of the energy efficiency focused initiatives throughout 16/17.

Events & Campaigns:

- Summer Shutdown: Encouraging vacationing staff and faculty to shut down and unplug office equipment.
- Get Your Fleece On: Providing blankets to those who pledge to reduce their reliance on space heaters or increasing the thermostat through the winter months.
- Small Appliance Audit: Determining where excessive plugload can be found in an effort to reduce reliance on duplicated or redundant equipment.
- Sweater Week: Lowering building temperatures and encouraging students, staff, faculty to wear layers - and sweaters, in an effort to lower GHG emissions and raise awareness of the effects of climate change.
- Waste Audit: 2<sup>nd</sup> annual waste audit returned similar poor results. There is a plan in place to re-vamp the entire waste receptacle layout to a more convenient and comprehensive system. We anticipate that this will have significant positive impacts on our waste diversion from the landfill.
- Experimenting with the using goats to remove invasive plant species in place of gas powered tools.

### Plans to Continue Reduction of Greenhouse Gas Emissions

In the upcoming year, we anticipate numerous energy audits, mechanical equipment upgrades, impactful LED upgrades, continued DDC optimization and a stronger sustainability culture throughout all levels of the UFV community.

### 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.fraserbasin.bc.ca/ccaq_plug_in_bc.html)

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

<http://thermenex.com/>



## University of the Fraser Valley

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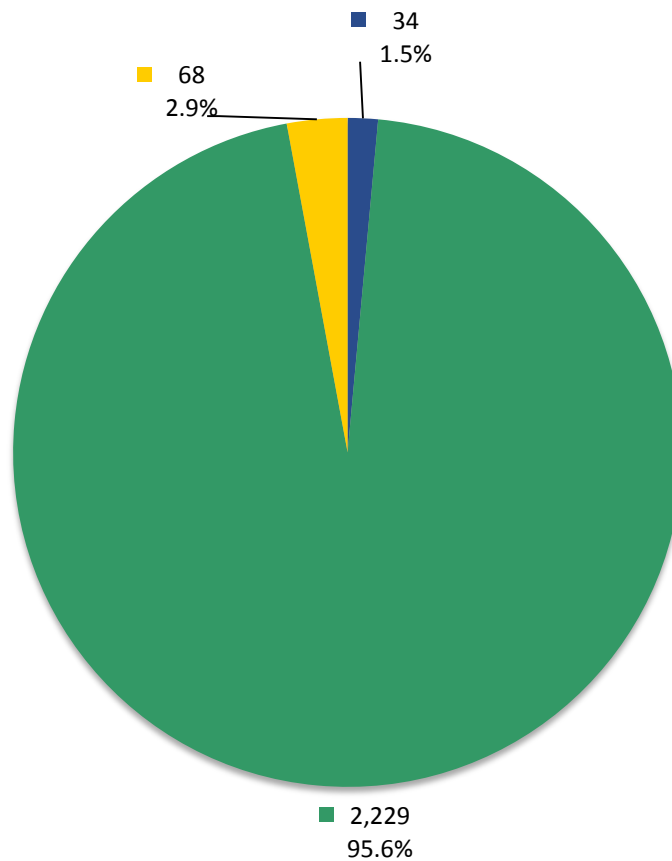
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# University of The Fraser Valley Greenhouse Gas Emissions by Source for the 2016 Calendar Year (tCO<sub>2</sub>e\*)



**Total Emissions: 2,331**

- 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 2016 (Generated May 15, 2017 4:21 PM)

Total offsets required: **2,330**. Total offset investment: **\$58,250**. 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):

*Blair McFarlane*

Organization Name:

*University of the Fraser Valley*

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.: 6
- Other actions? Please describe briefly.: Hired an energy manager to drive forward energy efficiency and sustainability projects. Commissioned set points and schedules through direct digital control. Behavioural campaigns aimed at reducing GHG's and energy. Lighting upgrades, BC Hydro's Continuous Optimization program (6 buildings) were also a part of our energy management program for 2016.

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

*UFV intends to reduce energy intensity (ekWh/m2) by 10% by 2021/22 – there will be a continued focus on reducing natural gas consumption and subsequent GHG emissions through equipment upgrades, as well as optimizing systems that are already in place.*

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

*No*

If yes, please describe briefly:

*(No response)*

## 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

*(No response)*

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

*UFV intends to reduce its emissions intensity from mobile sources through the electrification of our vehicles and equipment. As our campus continues to grow, the distances traveled continue to increase even with an increased focus on carpooling and efficient driving habits.*



### 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.: 30% recycled content required in paper purchases
  - Other actions? Please describe briefly.: UFV continued to encourage the reduction of paper use, and have continued to support a conservation culture whereby excessive paper consumption is frowned upon by nearly all departments, students, staff and faculty.

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

*UFV's waste removal systems upgrade in the summer of 2017 will greatly enhance a reduce-reuse-recycle culture on campus. There is the potential for this culture shift to continue to strengthen the conservation culture found in paper sourcing and end-uses.*

*Our IT department programs all of our 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.*

#### 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: IT has continued to upgrade their infrastructure and equipment to enable further video conferencing and mobile meetings.

##### 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)

#### Other Sustainability Actions:

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

Select all that apply

- 
- 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: In 2016, UFV initiated numerous sustainability projects and programs, including: Summer Shutdown of office equipment, Get Your Fleece On campaign to reduce reliance on space heaters and turning up the thermostat, small appliance audit to determine where excessive plugload was located, waste audit to identify how well, or poorly we are at reducing our waste. We hosted waste talks and workshops to encourage better composting and recycling habits, and turned down the temperatures for Sweater Week.