



2017 Carbon Neutral Action Report

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



This 2017 Carbon Neutral Action Report contains the University of the Fraser Valley's emissions profile, offsets purchased, the actions we have taken in 2017 to reduce greenhouse gas (GHG) emissions, and our plans to continue reducing emissions in 2018 and beyond.

By June 30th, 2018, 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. High value is placed on environmental, social, and economic sustainability in all institutional endeavours.

UFV remains committed to, and is actively pursuing the 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. The University continuously strives to be sustainable wherever economic and feasible, by design and retrofit through campus planning, through awareness and behavioural change within the learning community, and promoting initiatives and leadership inclusive of operations, curriculum, and the engagement of students and employees.

In 2017, approximately 16,500 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:

The 2017 report figures are evidence of the number of sustainability actions completed in the years leading up to, and including the reporting year, mitigating the effects of below average winter, spring and fall temperatures. Each action contributed significantly to our long-term goal of reducing UFV's energy consumption and carbon footprint. In 2017, UFV's building footprint briefly contracted with the lease of Chilliwack 5 Corners (650m²), and ultimately expanded with the acquisition of Canada Education Park Building S (2397m²) and as such the University now manages and maintains 92,835m² of core building space with an increasing scrutiny on environmental sustainability throughout all spaces.

The recent addition of campus buildings, retrofits and sales/leases of buildings will require the university to focus increasingly on metrics that normalize energy use based on space to provide a more functional perspective on GHG emissions consumption, reduction and targets. 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 2017 require an increased urgency for UFV to invest in de-carbonization by upgrading capital equipment, supporting electrification, and investing in innovative technologies. The SEMF will continue to provide direction for our actions based on evidence rooted in data.

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. 2017 marked our ninth 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. Travis Gingerich held this position from mid-2016 until his graduation in early 2018. His contributions to sustainability, energy efficiency and climate change education was substantial. Travis has left a lasting impression on the organization and his efforts have been instrumental in facilitating and inspiring positive change.

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 comprehensive waste stations are heavily used. Sustainability is 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 savings 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 maintained its place within the organization which has provided a legacy of championing and supporting environmentally responsible actions and initiatives within the UFV community. The advisory committee is comprised of three facilities personnel, one faculty, one student, and a member of the Faculty and Staff Association (FSA). Energy Manager, Blair McFarlane, continued 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, provided a perspective and voice for UFV employees. The changes and shifts in structure of the Centre for Sustainability in 2016 created numerous opportunities for the leadership group to excel, excite and motivate students, staff and faculty to reduce their environmental pact while on campus, as well as in their home communities. In 2017, those results came to fruition.

Executive Summary (Continued)

2017 Greenhouse Gas Emissions

The carbon footprint for the University of the Fraser Valley registered at 2,701 tCO₂e in 2017; that value was significantly higher than the last year's value of 2,338 tCO₂e. In relation to the University's activity as measured by full time equivalent (FTE) student enrolment (7,512), the 2017 carbon footprint was also slightly increased over the previous year. Last year's value of 0.314 tCO₂e/FTE was increased to 0.36 tCO₂e/FTE, an increase of 12.6% in GHG emissions when factoring a 0.95% increase in student enrolment.

It should be noted that below average temperatures were experienced in the first and final thirds of the 2017 year, and thus significantly increased the heating load and energy consumption in the heating seasons. The information provided throughout this report has not been normalized for weather, as we are reporting unaltered data. The 13.1% 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. UFV consumed 6,376 more gigajoules in 2017 compared to 2016, or, an average amount over the last 9 years.

Fleet emissions identified in 2017 were higher than typical (lower than last year) due to additional vehicles and sources being reported. While fleet emissions account for a small amount of emissions, alternative low-carbon transportation can have a significant impact on the culture of low-carbon economies. Fuel consumption decreased by 1,568 litres in comparison to 2016, 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 electrify the fleet in 2018 and beyond.

In 2017, we increased our consumption in the use and purchase of paper stock. Paper consumption was up 2.9% compared to 2016, with a nominal 355 packages purchases above last years totals, resulting in an additional 1.68 tCO₂e. These figures speak to the behavioural changes on campus as paper reduction continues to trend downwards resulting in an outstanding 55% decline in paper purchases from 2010 levels - 6,635 packages in 2017 alone.

Offsets Purchased to Become Carbon Neutral


In 2017, the University purchased offsets for 2,709 tCO₂e valued at \$71,111.25 net of GST.

EMISSIONS REDUCTION ACTIVITES

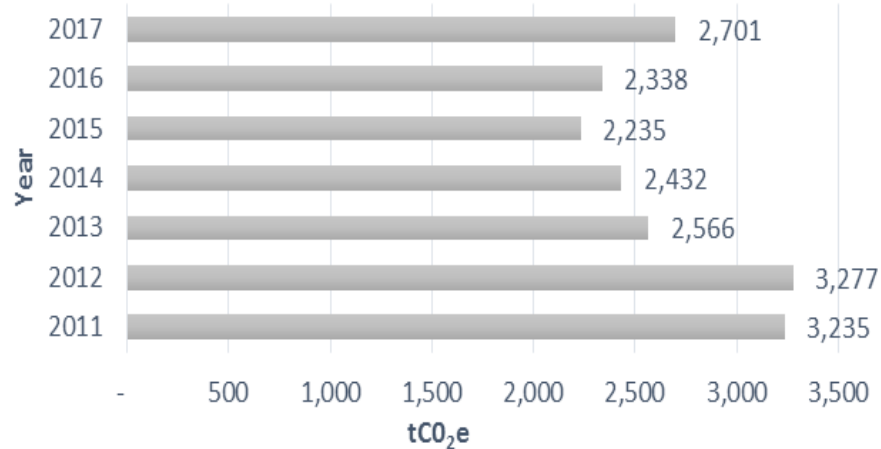
Emissions and Offset Summary Table:

<i>University of the Fraser Valley</i> GHG Emissions and Offset for 2017 (tCO ₂ e)	
GHG Emissions created in Calendar Year 2017	
Total Emissions (tCO ₂ e)	2702
Total Offsets (tCO ₂ e)	2701
Adjustments to GHG Emissions Reported in Prior Years	
Total Emissions (tCO ₂ e)	8
Total Offsets (tCO ₂ e)	8
Grand Total Offsets for the 2017 Reporting Year	
Grand Total Offsets (tCO ₂ e)	2709

Executive sign-off:

Signature		Date	May 24, 2018
Name (please print)	Betty Poettcker	Title	CFO + VP Administration

GHG Emission Comparison

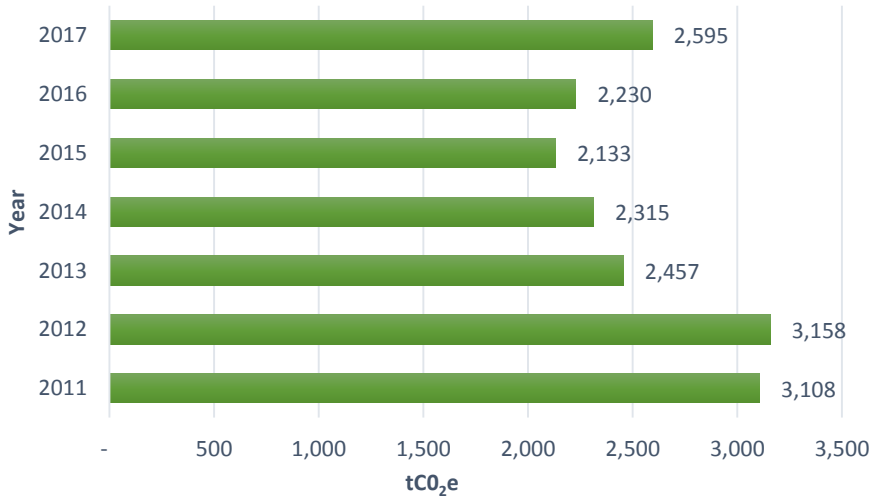


UFV's GHG Emissions by Source

In 2017, our total GHG emissions were 2,701 tonnes of CO₂ equivalent. The most significant emissions source was buildings, as natural gas is used for heating space and water. To a lesser degree the use of electricity which is 98% carbon emission free. These two energy sources in buildings combined for 96% of UFV's total emissions. Paper consumption at 2.58% and mobile (fleet) combustion rounding out a minor 1.38% were the remaining sources of emissions in 2017.



Buildings

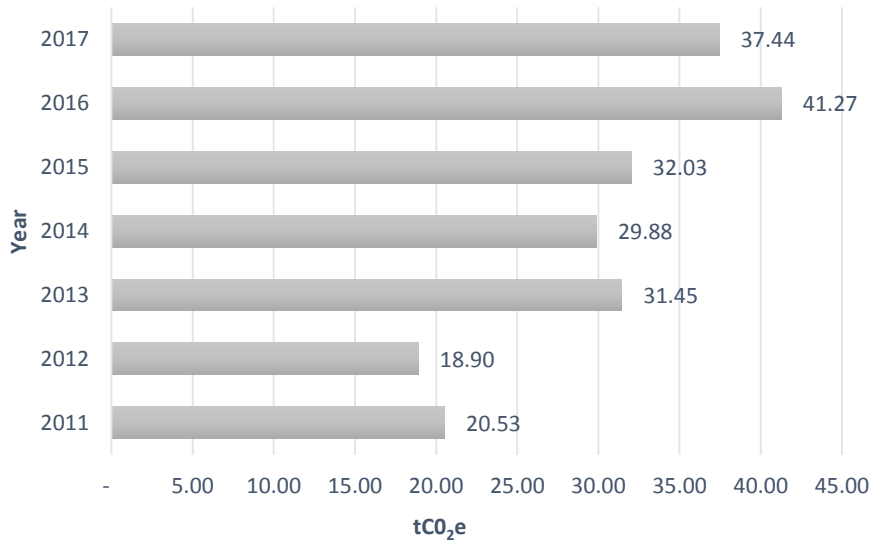


Buildings

A number of mechanical system upgrades and building energy retrofits reduced the impacts of a cold year (16% more HDDs), which resulted in a 13.4% energy consumption increase - however, maintained energy efficiency (tCO₂e/HDD/m²) at 0.2% higher than the previous year. We used an additional 6,376 gigajoules in 2017 than compared to 2016.



Fleet

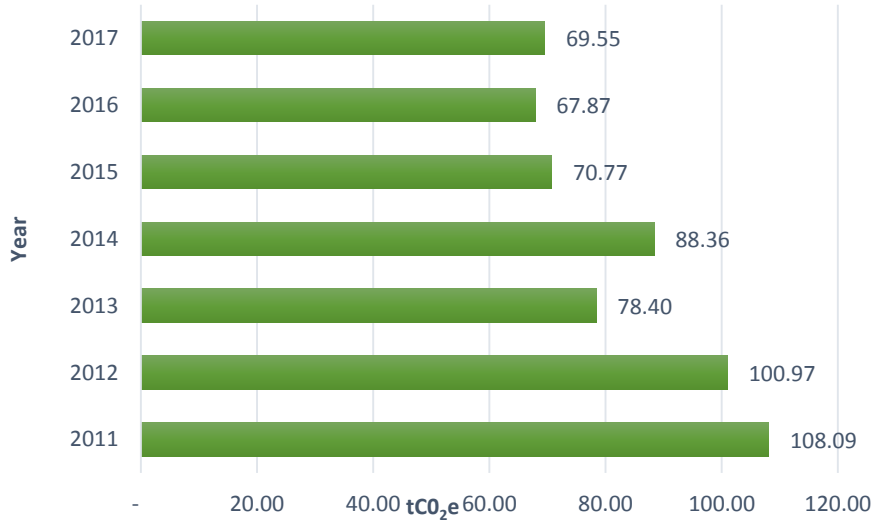


Fleet

After identifying missing fleet vehicles from our inventory in 2013 and again in 2017, a reduction in fuel consumption has been realized from 2016 totals. Overall, there was a resulting 1,568L reduction in fuel consumption in 2016 from the previous year. 2016 is proving to have been an outlier. 2018 will see the introduction of the first electric vehicle into the fleet, significantly reducing carbon emissions through gasoline avoidance.



Paper



Paper

In 2017, we maintained our consumption in the use and purchase of recycled paper stock at UFV. Paper consumption was 2.9% more than the previous year, which resulted in purchasing 355 additional packages of paper. Overall, five of the previous eight years have had year-to-year reductions in paper purchases. UFV is on the right path and will continue to identify opportunities to digitize paperwork. We have decreased our consumption by 35.7% from the peak in 2010.



OPERATIONAL CHANGES IN 2017

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 50% carbon emissions savings compared to other buildings on the Abbotsford campus that utilize more traditional heating systems.

Similarly, CEP A, another LEED building, continues to be commissioned with increasingly positive energy efficiency returns, reducing carbon emissions by 48% compared to traditional buildings during the same time frame.

Overall, operationally, processes have remained similar. The focus continues to be on increasing efficiency on existing systems, and experimenting with minor innovative technologies. It's expected that more impactful changes in processes and technology will be introduced into the operations of UFV.

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 Bldg A chiller upgrade
- Abbotsford Bldg B cooling tower upgrade
- Abbotsford Bldg B lecture hall LED upgrade
- Abbotsford Bldg C exterior door insulation upgrade
- Abbotsford Bldg G entrance LED upgrade
- Abbotsford Bldg G library LED upgrade
- Abbotsford Bldg G solar PV feasibility study
- CEP Bldg A heating/cooling cross connection corrections
- CEP Bldg T interior LED lighting purchased
- CEP Bldg T overhead door installations (2)
- DDC holiday re-scheduling to optimize HVAC
- EndoTherm Innovation Fund project installation
- Fortis BC Commercial Energy Assessments

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 17/18.

Events & Campaigns:

- Energy Efficient Residence: Installed signage in each room outlining ways for residents to reduce energy use and increase sustainable habits.
- Get Your Fleece On 2.0: Providing blankets to those who pledge to reduce their reliance on space heaters or increasing the thermostat through the winter months.
- 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: 3rd annual waste audit data outlined an increase in compliance. A new Sustainable Waste Stations project was rolled out, encouraging the diversion of waste from the landfill into alternative more sustainable streams. The four bin system includes: Organics/Compost, Mixed Recycling, Refundables, and a bin for Landfill items. The data identified confusion that remains with organics and the landfill. 2017/2018 will focus on diverting organics from the landfill, and increasing the overall compliance of each 4 streams.
- 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://thermenex.com/>



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Part 1: CNAR Survey

1. General Information

Name: Blair McFarlane

Contact Email: blair.mcfarlane@ufv.ca

Organization Name: University of the Fraser Valley

Sector: Post Secondary

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

During 2017, did your organization take any of the following actions to support emissions reductions from buildings? (please select all that apply)

Conducted an energy audit/study of building(s) in the organization's portfolio.; Performed energy retrofits of the organization's building(s)

If you selected "*Performed energy retrofits of the organization's building(s)*":

How many buildings were retrofitted?:

If you selected "*Built, or are building new LEED Gold or other "Green" buildings*":

How many new "Green" buildings?:

Did your Organization perform any retrofits during 2017? Please describe briefly:

Abbotsford Campus Building G: Library LED retrofit

Abbotsford Campus Building B: Lecture hall LED retrofit

Abbotsford Campus Building B: Chiller upgrade

Abbotsford Campus Building A: Chiller upgrade

Abbotsford Campus Building C: Overhead door insulation upgrade

Canada Education Park Campus Building T: Overhead door(s) insulation upgrade

2a. Stationary Sources (eg. Buildings, Power Generators): Fuel Combustion, Electricity use, Fugitive Emissions.

Please briefly describe your organization's plans to continue reducing emissions from its stationary sources:

a) Over the next 1-5 years

The University will:

- Continue to upgrade existing lighting to LED
- Optimize the Building Automation System, and associated controls
- Upgrade major systems and equipment to increase energy efficiency
- Invest in carbon capture technologies
- Investigate fuel switching and electrification
- Analyze, and implement where appropriate, renewable energy projects
- Develop a carbon emissions reduction target and plan
- Educate and facilitate behaviour change

b) Over the following 6-10 years

UFV will continue to:

- Optimize the Building Automation System, and associated controls
- Upgrade major systems and equipment to increase energy efficiency
- Investigate fuel switching and electrification
- Analyze, and implement where appropriate, renewable energy projects
- Track progress and update the carbon emissions reduction plan
- Educate and facilitate behaviour change

3. Mobile Sources (Vehicles, Off-road/portable Equipment): Fuel Combustion:

During 2017, did your organization take any of the following actions to support emission reductions from its mobile sources? (please select all that apply)

None of the above

If you selected "*Replaced existing vehicles with more fuel efficient vehicles (gas/diesel)*":

How many vehicles?:

If you selected "*Replaced existing vehicles with hybrid or electric vehicles*":

How many vehicles?:

3a. Mobile Sources (Vehicles, Off-road/portable Equipment): Fuel Combustion:

Please briefly describe your organization's plans to continue reducing emissions from its mobile sources:

a) Over the next 1-5 years

Immediately the University is re-organizing its logistics department. This is to reduce the frequency and duration of travel between campuses, resulting in reduced emissions.

The University will investigate its capacity and capability to electrify its fleet. Utilizing low-carbon transport and expanding the number of, and geographic area serviced by, electric vehicle charging stations throughout major campuses will be essential in decreasing emissions from mobile sources.

b) Over the following 6-10 years

As technologies advance and become increasingly reliable and diverse in their commercial availability, UFV will continue to de-carbonize its fleet, heavy equipment, and portable equipment.

4. Supplies (Paper): Indicate which actions your PSO took in 2017:

During 2017, did your organization take any of the following actions to support emissions reductions from paper supplies? (please select all that apply)

4) Supplies (Paper): Indicate which actions your PSO took in 2017: - Other? Please describe briefly: No specific policy is in place, however, it 30% recycled is the minimum standard on purchase requirements.

If you selected "*Had a policy requiring the purchase of recycled content paper*":

State the required recycled content here (30%, 50%, 100%):

If you selected "*Had a policy requiring the purchase of alternate source paper (bamboo, hemp, wheat, etc)*", which type of alternate source paper did you use?

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

The University continues to digitize events, meetings, and coursework in an effort to make materials more accessible while reducing environmental impacts. A renewed effort to remind staff to print double sided as a default setting on multi-function devices is aimed at re-aligning behaviours with sustainability commitments.

5. Other Sustainability Actions

a) Business Travel

During 2017, did your organization take any of the following actions to support emissions reductions from business travel? (please select all that apply)

Encouraged alternative travel for business (e.g. bicycles, public transit, walking)

b) Education/Awareness

During 2017, did your organization have any of the following programs or initiatives to support sustainability education and awareness? (please select all that apply)

A 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

c) Other Sustainability Actions

During 2017, did your organization have any of the following programs or initiatives to support sustainability? (please 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; Lifecycle costing of new construction or renovations