



# 2016 Carbon Neutral Action Report



**THOMPSON  
RIVERS  
UNIVERSITY**

Sustainability  
Office



“TRU is an... environmentally responsible institution...”.





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Images from various 2016 campus events and campaigns



## 1.0 Declaration Statement & Executive Summary

### Declaration Statement

This Carbon Neutral Action Report for the period January 1st, 2016 to December 31st, 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 emissions and our plans to continue reducing emissions in 2017 and beyond.

By June 30, 2017 Thompson Rivers University's final Carbon Neutral Action Report will be posted to our website at [www.tru.ca/sustain/initiatives/reporting](http://www.tru.ca/sustain/initiatives/reporting)

### Executive Summary

Thompson Rivers University has identified "Increasing Sustainability" as a strategic priority and one of seven founding values. In 2014, TRU developed a comprehensive Strategic Sustainability Plan (SSP) that provides the framework to measure and make improvements on four key sustainability-related areas to reduce greenhouse gas emissions (GHG). The four key areas (Operations, Engagement, Learning and Governance) are further broken down into 18 sub-themes and within those themes there are 130 initiatives to improve sustainability throughout every level of the institution. In 2016 TRU made significant progress, meeting or exceeding targets and goals in all four key areas. While energy and waste related projects and initiatives continued to be a focus, educational and awareness, employee training, alternate transportation strategies, paper reduction strategies and sustainable building design were also highlighted. The entire TRU community played a role in making the year successful, and the level of engagement in 2016 has emphasized the commitment to sustainability throughout every level of the institution.

TRU's Office of Sustainability has a full-time Director who also serves as TRU's Energy Manager. The position is partly funded through BC Hydro's Energy Manager Program. In addition, the Office of Environment and Sustainability has a full-time Environmental Programs and Research Coordinator, Fortis BC funded Energy Specialist, and numerous co-op and research students to assist with various initiatives and research. The Office of Sustainability works closely with the Facilities Office and Capital Projects Director on a multitude of energy related projects. The Office also works closely with Human Resources and with staff and students in a variety of sustainability-related co-curricular education and awareness campaigns. TRU's annual in-service professional development days as well as International Days weeklong event, were both focused on sustainability. In addition, TRU launched two new Sustainability Ambassador Programs that engage both staff and students into peer-to-peer sustainability-related education and awareness. TRU has again been recognized as a leader in advancing sustainability and has been asked to present at International conferences.

Over the past six years energy consumption has gone down significantly and Green House Gas Emissions have been reduced by approximately thirty percent while paper use has gone down by sixty percent. The progress affirms TRU's commitment to meeting the requirements of the Greenhouse Gas Reduction Targets Act. The groundswell of engagement and empowerment related to all aspects of sustainability on campus is palpable. Evidence that progress to date can only be achieved when sustainability is championed by the entire TRU community, is integral and evident in all processes and functions, and is central to the ethos of the organization. These significant milestones, plus ongoing initiatives, reinforce that TRU is on track to reach provincial GHG reduction targets well ahead of schedule.

James Gudjonson

Director, TRU Sustainability Office



## 2.0 2016 Greenhouse Gas Emissions

### 2.1 Offsets Applied to Become Carbon Neutral in 2016

Thompson Rivers University's greenhouse gas emission calculations include emissions from both the Kamloops and Williams Lake campuses, along with all in-scope leased or owned regional centres. In 2016, TRU's emissions amounted to 3,359 tons of carbon dioxide equivalent (tCO<sub>2</sub>e) and total offsets required were 3,106 tCO<sub>2</sub>e.

#### Exclusions

It was estimated that stationary fugitive emissions from cooling comprised less than 0.01% of Thompson Rivers University's total emissions. TRU deemed fugitive emissions out-of-scope as per the 1% Rule listed in the *2014/2015 B.C. BEST PRACTICES METHODOLOGY FOR QUANTIFYING GREENHOUSE GAS EMISSIONS*, Annex 8.3 (How to Treat Small Emissions Sources), Table 18, due to the disproportionately onerous task of measuring those emissions.

#### Offsets Applied

Reporting period 2016 offsets were 3,106 tCO<sub>2</sub>e, for a total offset investment of \$77,650.00. 252.44 tonnes of BioCO<sub>2</sub>e from Scope 1 did not require an offset payment. Those emissions were deemed offset exempt, or carbon neutral, as illustrated in the Totals table below.

#### Totals Calendar Year 2016, Thompson Rivers University

	Measure	Quantity	Greenhouse Gases in Tonnes				tCO <sub>2</sub> e <sup>1</sup>
			CO <sub>2</sub>	BioCO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	
<b>Scope 1 (Direct) Emissions</b>							
Mobile Combustion (Fleet)	Litres	51,099.04	114.61	5.69	0.01	0.02	127.85
Stationary Combustion, Reported <sup>3</sup>	GigaJoules	59,553.10	2,704.74	246.75	0.06	0.05	2,968.95
<b>Scope 2 (Indirect) Emissions</b>							
Purchased Energy, Reported <sup>3</sup>	GigaJoules	52,241.79	156.73	0.00	0.00	0.00	156.73
<b>Scope 3 (Business Travel and Office Paper) Emissions</b>							
Office Paper	Packages	18,039.00	105.18	0.00	0.00	0.00	105.18
<b>Total Emissions, Calendar Year 2016</b>			<b>3,081.26</b>	<b>252.44</b>	<b>0.07</b>	<b>0.08</b>	<b>3,359</b>
<b>Carbon Neutral or Offset Exempt</b>			<b>0.00</b>	<b>252.44</b>	<b>0.00</b>	<b>0.00</b>	<b>252</b>
<b>Total for Offsets<sup>4</sup></b>			<b>3,081.26</b>	<b>0.00</b>	<b>0.07</b>	<b>0.08</b>	<b>3,106</b>

1. Each greenhouse gas has been converted to a standard measurement (tCO<sub>2</sub>e) by multiplying its emissions by its global warming potential (GWP). The GWP of carbon dioxide (CO<sub>2</sub>) from both anthropogenic and biogenic sources is 1; methane (CH<sub>4</sub>) is 25, and nitrous oxide (N<sub>2</sub>O) is 298. The Totals for tCO<sub>2</sub>e are shown here rounded to the nearest whole metric tonne as only whole tonnes of tCO<sub>2</sub>e can be purchased for offsets.

2. Estimated data has been calculated based on the methods described in the Methodology Document.

3. Reported data refers to consumption which has been directly billed to the organization.

4. The tCO<sub>2</sub>e value from the "Total for Offsets" line represents the quantity of offset purchases required to become carbon neutral.

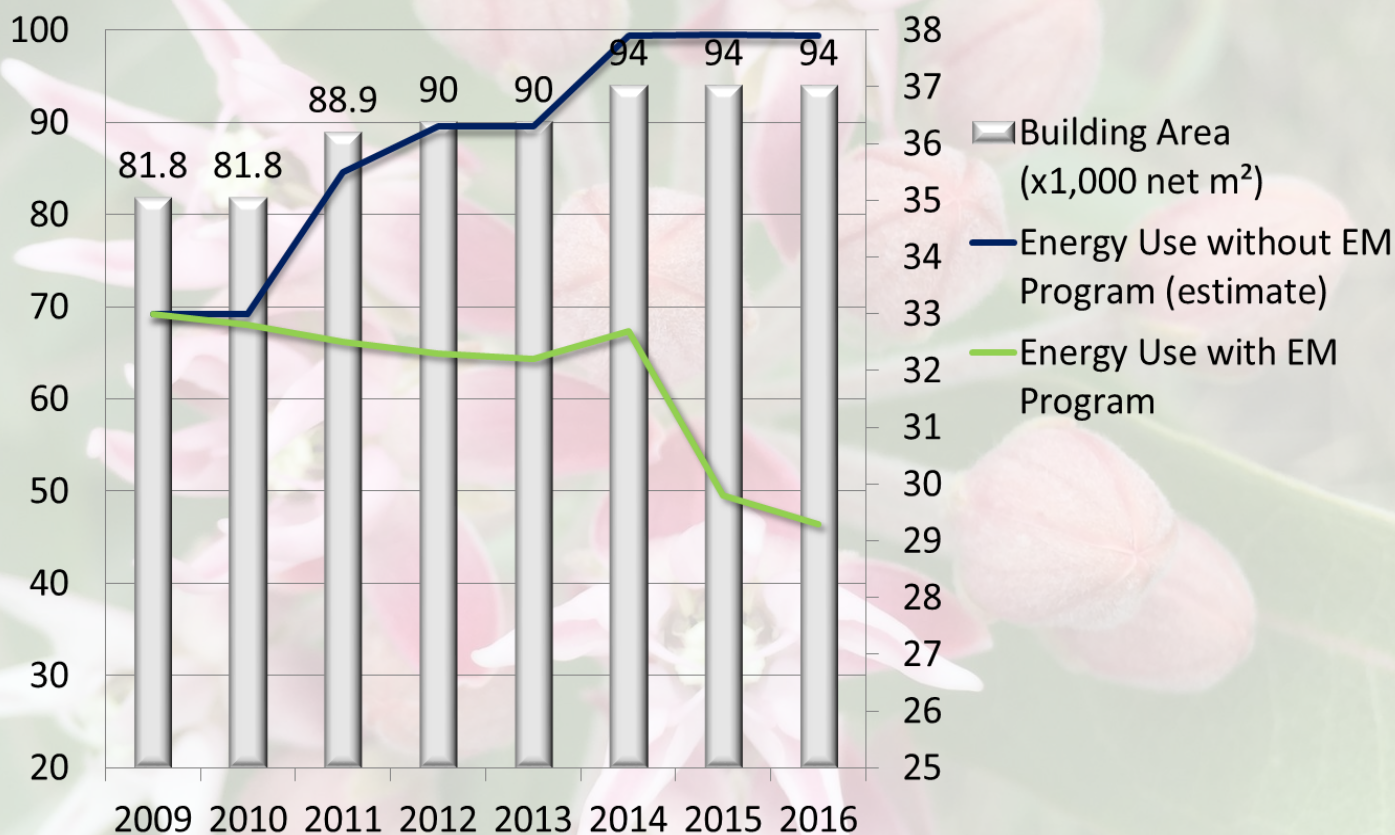


### 3.0 Actions Taken to Reduce Emissions in 2016

#### Energy Reduction Projects and Initiatives

##### Revolving Energy Fund

The Revolving Energy Fund (REF) was instrumental throughout 2016 in supporting TRU's Strategic Energy Management Plan (SEMP). TRU's Energy Manager and Energy Specialist oversaw the implementation of numerous technical projects that resulted in a 30 percent reduction below 2010 baselines. TRU remains on track towards a 33 percent reduction in GHG emissions by 2022. In addition to technical changes, TRU's Workplace Conservation Awareness Program, which educates, engages and empowers students and staff, has helped garner the much needed internal support towards reducing our carbon emissions and environmental impact. The table below illustrates TRU's reductions to date relative to growth.



##### Continuous Optimization Program

TRU has enrolled all its major buildings into BC Hydro's Continuous Optimization Program (COP). The multi-year program utilizes TRU's Energy Management Information System software (EMIS) to analyze buildings' energy efficiency and is designed to reduce energy use through low cost re-commissioning measures. In 2016 the completion of 2 additional buildings, The Old Main building in Kamloops and the William lake main building, brings the total completed buildings to 9 and the end of phase 1 of the program.



### 3.0 Actions – continued

#### Campus wide - LED Retro-fit

The Remaining areas on campus as well as the Williams lake campus were retro-fitted to LED lighting technology, which now includes all high shop bays, approximately 500 walkway, parking and street lights, and roughly 20,000 lamps including offices, hallways and classrooms. Table 6c illustrates the reductions in energy use per square foot.

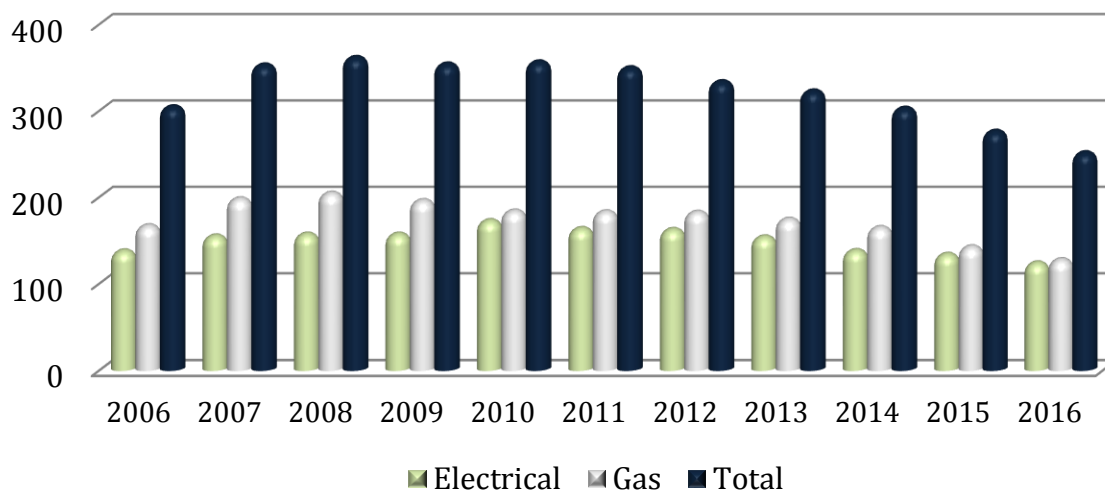


Table 6.c. Building Energy Performance Index (BEPI)

#### Wood Bio-Mass Boiler for Williams Lake Campus

TRU partnered with the school district in Williams Lake to install a wood bio-mass boiler to supply the campus and adjacent school with heat from a medium size wood bio-mass boiler system. The boiler will reduce natural gas use and GHG emissions by approximately 80 percent and was commissioned in the fall of 2016.

### Sustainability Initiatives

#### Transportation

TRU underwent a study in 2014/15 to identify the potential GHG and operational savings related to transitioning the fleet from combustion to electric (EV) or hybrid vehicles. In 2016 the Sustainability Office began the transition with the purchase of 4 EV/hybrids, as well as partnering with a car share service provider (Zip Car) for students. The new alternate fuel fleet will continue to grow over the coming years, ultimately resulting in a ninety percent reduction in GHG emissions related to transportation. The Zip Car use is also anticipated to increase with an anticipated reduction of .65 tons GHG emissions per commuter.

#### Paper use

TRU has aggressively reduced paper use on campus, resulting in less paper in the recycling and waste streams. In addition to new printers that default to double-sided printing, improvements in technology for submitting documents and various other digital forms and applications have also been implemented. The guiding document for the Sustainability Ambassadors Program outlines multiple opportunities for reducing paper consumption such as online marking programs and copying reports double sided.



## 3.0 Actions – continued

### Sustainability Initiatives - continued

#### Zero Waste Initiative

TRU committed to establishing a zero waste institution in 2014 and installed approximately 500 zero waste bins to provide a consistent and efficient sorting method for staff, faculty and students. In 2016 additional zero waste containers were added including larger systems and bins for construction and demolition waste. TRU is a member of the National Zero Waste Council and is actively involved in educational opportunities to ensure compliance with established zero waste best practices. All events and functions on campus are zero waste events and include student, staff and faculty volunteers standing at each station aiding users in properly disposing of their waste and answering any waste related questions. As well, the Sustainability Office has developed a comprehensive outreach program that includes presentations to departments on proper waste strategies on campus. Through these initiatives, waste practices on campus have improved with less materials going to the landfill.

#### Sustainability Office Ambassador Program

The Sustainability Office piloted the Sustainability Ambassadors program in 2015 and based on the success of the program added 18 new departments. A delegate from a campus office/department is chosen to be the sustainability champion and identifies challenges within their work setting. They then provide one-on-one solutions for improving the sustainability of their work environment. These ambassadors are integral in changing the way people view everyday situations ‘through a sustainability lens’. As part of the program, the Sustainability Office developed four toolkits to help ambassadors in their sustainability efforts: Energy Conservation, Zero Waste, Energy Conservation, Sustainable Printing and Paper Saving/Go Digital. Future toolkits, such as transportation and food/dining, will also be developed.

#### Campus Community Engagement

##### TRU Sustainability Ambassadors Program

Employees from every department are encouraged to join the Sustainability Ambassador Program. TRU staff or faculty members, become the ‘sustainability champions’ of their offices/departments/work areas, and help to communicate to their work-mates the initiatives being promoted. Participation is during paid work time and involves 4 hours/month. Ambassadors can choose between four sustainability toolkits: Energy Conservation, Zero Waste, Energy Conservation, Sustainable Printing and Paper Saving/Go Digital. The program is focused on increasing participation in, and support for, sustainability practices and behaviours, whether new or existing, big or small. The program is coordinated through the TRU Sustainability Office, which organizes quarterly meetings and offers training and on-going support (this training can be used towards professional development opportunities).

The energy conservation toolkit guides users in simple conservation steps such as turning out unused lights, unplugging unused appliances, and installing timers to save on electricity.

The zero waste toolkit guides users on proper waste practices by rethinking, reducing, reusing and recycling materials. The toolkit provides guidance on reducing the amount of waste produced and increasing recycling rates. It covers all waste/recycling streams on campus including: (a) recycling, (b) compost, (c) refundable bottles and cans, (d) plastic bags, (e) landfill waste and (f) additional recycling items (wood pallets, Keurig cups and hazardous waste for example).

The last two toolkits (sustainable printing and paper saving/go digital) go hand-in-hand and first ask users to consider ways to reduce paper use, and then, if it is determined that printing has to take place, how to do so as efficiently as possible.





## 4.0 Plans To Continue Emission Reductions Moving Forward

### Energy Projects

#### **Custom Design Program (BC Hydro, Fortis BC)**

A custom design funding application was completed 2016, and will include heat recovery, HVAC upgrades, fume hood upgrades and domestic water supply upgrades. The study has moved to the implementation phase

#### **Residences**

The campus residences energy audits and retrofits have been completed and have identified significant energy and GHG savings opportunities. The project is now in the implementation phase and expected to completed over the summer of 2017

#### **Waste Heat Recovery**

Currently TRU and BC Hydro are exploring waste heat recovery in the campus residences. The relatively new technology will extract waste heat from the sewer main to preheat domestic hot water. The preliminary study identifies significant GHG savings in a cost effect and non-intrusive way.

#### **COP Phase II**

BC Has announced a phase 2 of the Continuous Optimization Program. TRU has applied for the first of 9 buildings to go through the new program.

#### **Electric Boiler – Trades and Technology Buildings**

TRU is currently building a new Trades and Technology Center (ITTC) which is situated adjacent to the existing Trades and Technology Building. The ITTC will have an electric boiler plant that will be designed to heat the ITTC and the old Trades and Technology building, resulting in a 10 percent reduction in campus GHG emissions.



## 4.0 Plans –continued

### Sustainability Projects

#### Campus Community Engagement (continued)

##### Student to Student Sustainability Educators Program

This new program will roll-out in the fall of 2017. Students will have to apply to the program and selected applicants will go through a basic training before engaging in educating other students about broad sustainability issues, such as energy conservation, zero waste and paper use. Predetermined toolkits will be used and on-going support will be provided. Students will need to complete x number of hours before they are awarded a certificate of completion and be awarded a cash value which can be used to help pay for future TRU courses.

#### Waste Transfer Station

The feasibility study to examine the potential to facilitate more waste diversion with a centralized waste transfer station continues from 2014. The station will house the two composters, organic material pre-grinder, compactor and light bulb recycler. In addition to increased diversion rates, the transfer station will increase in-house waste management efficiencies, and reduce tipping frequency and the amount of garbage trucks driving around campus.

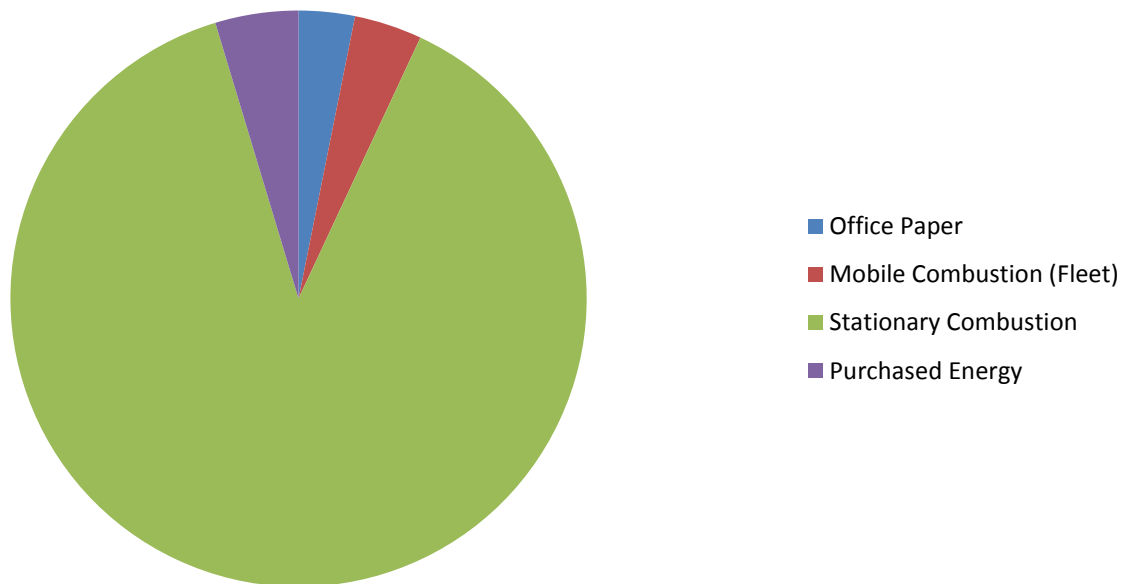
#### Fleet Certification

TRU is enrolling in the E3 Fleet certification program (<http://www.e3fleet.com/>). The end goals of the program are to reduce the amount emissions produced by all fleet vehicles and cut down on vehicle maintenance costs. In conjunction with the program, all TRU fleet drivers go through a driver training program.



## 5.0 Actions Towards Carbon Neutrality

### Thompson Rivers University Greenhouse Gas Emissions by Source for 2016 (in tCO<sub>2</sub>e1)



### Offsets Applied to Become Carbon Neutral in 2015 (generated May 17, 2016)

Total offsets required: 3,106. Total offset Investment: \$77,650.00.

Emissions not requiring offsets: 252\*\*

\*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 sources listed above must be reported. As outlined in the regulation, some emissions do not require offsets.