



## 2017 Carbon Neutral Action Report





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



**Declaration statement:** This Carbon Neutral Action Report for the period January 1<sup>st</sup>, 2017 to December 31<sup>st</sup>, 2017 summarizes our emissions profile, the total offsets to reach net-zero emissions, the actions we have taken in 2017 to reduce our greenhouse gas emissions and our plans to continue reducing emissions in 2018 and beyond.



THOMPSON RIVERS  
UNIVERSITY

Sustainability Office

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# Contents

- 1.0 Executive Summary
- 2.0 2017 Greenhouse Gas Emissions
  - 2.1 Offsets Applied To Become Carbon Neutral in 2017
- 3.0 Actions Taken to Reduce Emissions in 2017
- 4.0 Plans to Continue Emission Reductions Moving Forward
- 5.0 Actions Toward Carbon Neutrality



Images from various 2017 campus events and campaigns



## 1.0 Executive Summary

Thompson Rivers University identified “Increasing Sustainability” as a strategic priority in 2013. As a result, a comprehensive Strategic Sustainability Plan (SSP) was developed providing a 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 2017 TRU made significant progress, meeting or exceeding targets and goals in all four key areas. Two new buildings currently under construction will be built adopting electrification strategies that will actually see a net reduction in overall campus GHG emissions. Numerous energy conservation projects were completed in 2017 further reducing overall GHG emissions. Educational and awareness, employee training, alternate transportation strategies, paper reduction strategies and construction waste management were also key areas of focus. The entire TRU community was fully engaged in making the year a success emphasizing TRU’s continued commitment to sustainability.

TRU’s Sustainability Office 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 Sustainability Office 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 Sustainability Office 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 showcase event, the weeklong International Days (I-Days) focused on awareness of the United Nations Sustainable Development Goals.

The progress to date affirms TRU’s commitment to meeting the requirements of the Greenhouse Gas Reduction Targets Act. The ground swell 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.

A handwritten signature in black ink, appearing to read 'James Gudjonson', with a large, sweeping flourish extending to the right.

James Gudjonson

Director, TRU Sustainability Office



## 2.0 2017 Greenhouse Gas Emissions

### 2.1 Offsets Applied to Become Carbon Neutral in 2017

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 2017, TRU's emissions amounted to 3,485 tons of carbon dioxide equivalent (tCO<sub>2</sub>e) and total offsets required were 3,234 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 2017 offsets were 3,234 tCO<sub>2</sub>e, for a total offset investment of \$80,850.00. 252 tCO<sub>2</sub>e from Scope 1 (Mobile Combustion (Fleet) and Stationary Combustion) did not require an offset payment. Those emissions (251.58 BioCO<sub>2</sub>) were deemed offset exempt, or carbon neutral, as illustrated in the Totals table below.

#### Totals Calendar Year 2017, 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	58,787.47	135.40	4.83	0.01	0.03	148.84
Stationary Combustion, Reported <sup>3</sup>	GigaJoules	62,719.80	2,861.75	246.75	0.06	0.06	3,126.89
<b>Scope 2 (Indirect) Emissions</b>							
Purchased Energy, Reported <sup>3</sup>	GigaJoules	51,657.86	154.97	0.00	0.00	0.00	154.97
<b>Scope 3 (Business Travel and Office Paper) Emissions</b>							
Office Paper	Packages	9,382.00	54.54	0.00	0.00	0.00	54.54
<b>Total Emissions, Calendar Year 2017</b>			<b>3,206.66</b>	<b>251.58</b>	<b>0.07</b>	<b>0.08</b>	<b>3,485</b>
<b>Carbon Neutral or Offset Exempt</b>			<b>0.00</b>	<b>251.58</b>	<b>0.00</b>	<b>0.00</b>	<b>252</b>
<b>Total for Offsets<sup>4</sup></b>			<b>3,206.66</b>	<b>0.00</b>	<b>0.07</b>	<b>0.08</b>	<b>3,234</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.

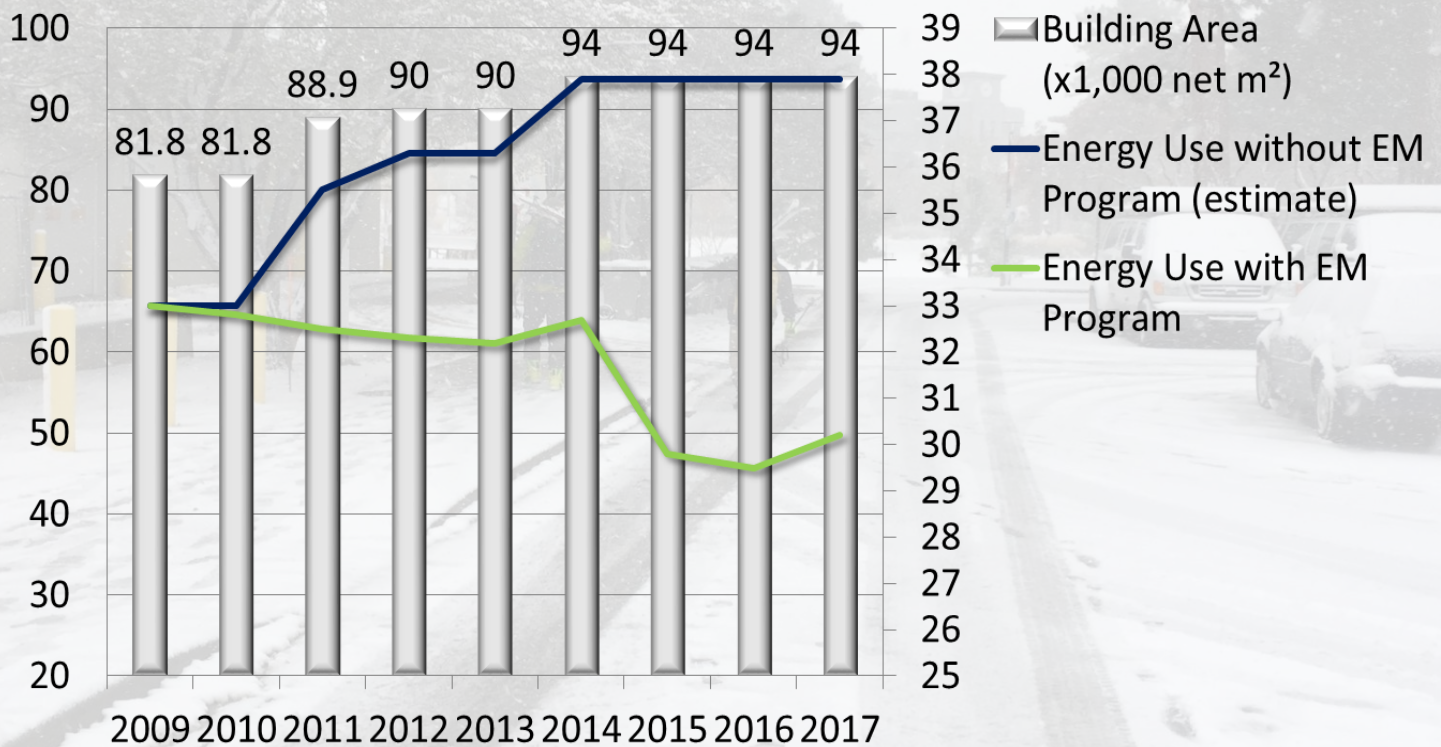


### 3.0 Actions Taken To Reduce Emissions in 2017

#### Energy Reduction Projects and Initiatives

##### Revolving Energy Fund

The Revolving Energy Fund (REF) continues to anchor the energy conservation initiatives and support TRU’s Strategic Energy Management Plan (SEMP). TRU’s Energy Manager and Energy Specialist oversaw the implementation of numerous technical projects that have resulted in a 30 percent reduction below 2010 baselines. TRU remains on track towards a 40 percent reduction in GHG emissions by 2022. In addition to technical changes, TRU’s involvement in the Energy Wise Network Program and the TRU Sustainability Ambassadors Program, which educate, engage and empower students and staff, have 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 of 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. Several buildings are now entering phase 2 of the program.

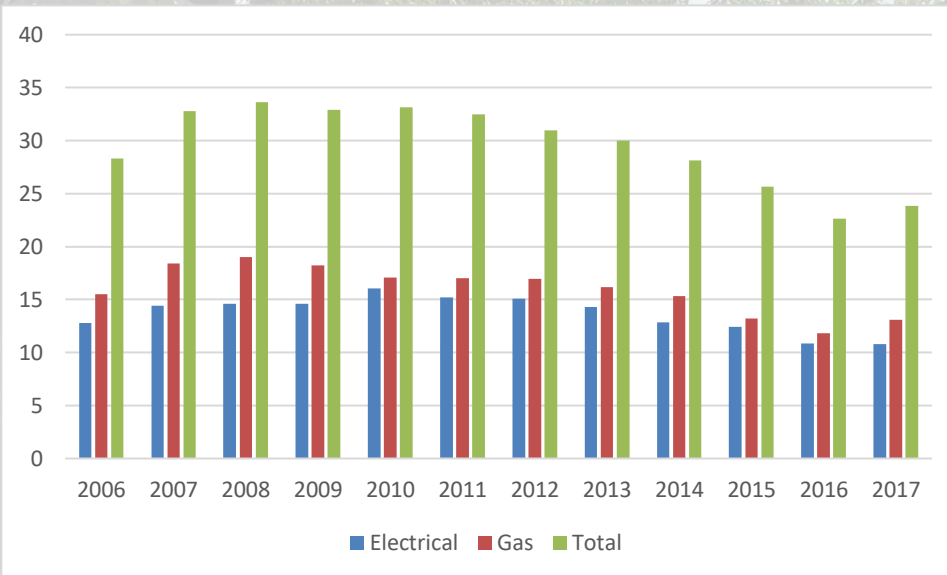


### 3.0 Actions – continued

#### Campus wide - LED Retro-fit

Over the past year the TRU residence buildings were also retro-fitted to LED lighting technology. The entire campus has now been retro-fitted to LED now totalling over 20,000.

Table 6c illustrates the reductions in energy use per square foot.



#### Old Student Residence Building Energy Upgrades

TRU Purchased McGill residences and immediately undertook energy audits. The energy audits were followed-up with comprehensive energy efficiency upgrades and retrofits. The upgrades have resulted in a twenty percent reduction in energy use and GHG emissions.

#### New Student Residence Building Energy Upgrades

TRU’s main student residences and conference center also went through comprehensive energy audits and upgrades. The heating and lighting systems were upgraded and have resulted in roughly 15 percent reductions in energy use and GHG emissions.

### 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 (Zipcar) for students. In 2017 TRU added two new vehicles to the alternate fuel fleet. Zipcar continues to grow with an anticipated reduction of .65 tons GHG emissions per commuter. The Sustainability Office also launched a bike share program that includes ‘fat’ bikes which are specially designed to ride in winter months on icy/snowy trails. The program has been well received by students and staff.



## 3.0 Actions – continued

### Sustainability Initiatives - continued

#### 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 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.

#### Sustainability Parking Framework

TRU's sustainable parking framework has reduced Single Occupancy Vehicles (SOV) by twenty-five percent. This has resulted in increased transit ridership and carpooling as well as more students and staff cycling and walking.

#### 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.

#### 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).





## 4.0 Plans To Continue Emission Reductions Moving Forward

### Energy Projects

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

A new custom design funding project is underway, and will include heat recovery, HVAC upgrades, fume hood upgrades and domestic water supply upgrades.

#### **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 effective and non-intrusive way.

#### **COP Phase II**

TRU has committed to begin this year.

#### **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.

### Transportation

#### **Electric Bike Program**

TRU is currently launching an Electric Bike (E-bike) Share Program and employee E-bike purchase program – the target is to have 100 E-bike commuters within one year.



## 4.0 Plans –continued

### Sustainability Projects

#### Campus Community Engagement (continued)

##### Student to Student Sustainability Educators Program

This program rolled-out in the fall of 2016. Students 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 amount 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

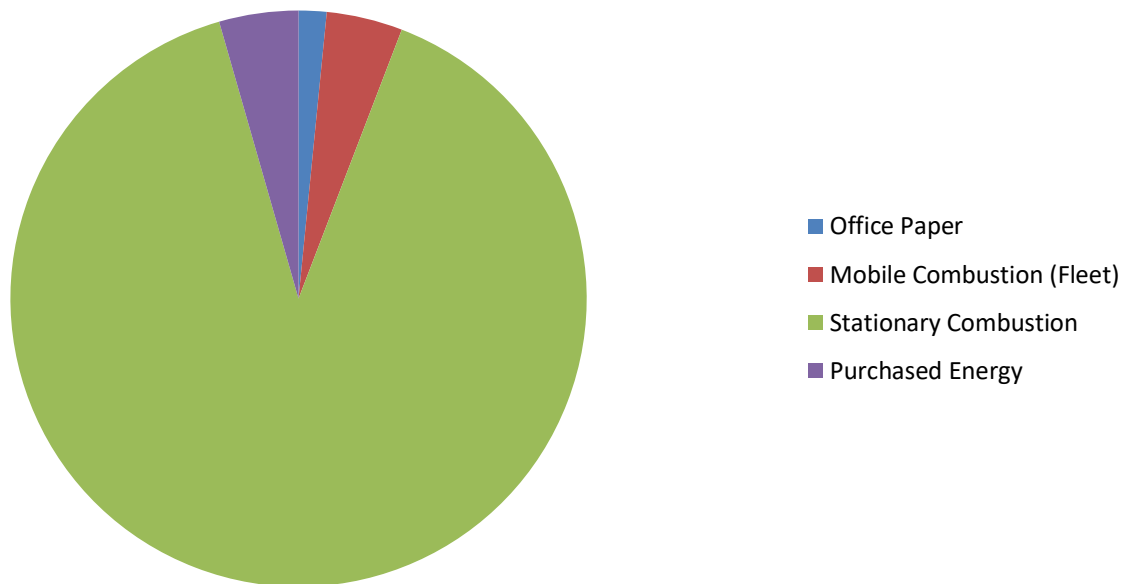
The feasibility study to examine the potential to facilitate more waste diversion with a centralized waste transfer station continues from 2014. The station will house the two composters, organic material pre-grinder, compactor and light bulb recycler. In addition to increased diversion rates, the transfer 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 of emissions produced by all fleet vehicles and cut down on vehicle maintenance costs. In conjunction with the program, all TRU fleet drivers will go through a driver training program.



### Thompson Rivers University Greenhouse Gas Emissions by Source for 2017 (in tCO<sub>2</sub>e1)



### Offsets Applied to Become Carbon Neutral in 2017 (generated May 16, 2018)

Total offsets required: 3,234. Total offset Investment: \$80,850.00.

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.