2015 Carbon Neutral Action Report

THOMPSON RIVERS UNIVERSITY

"TRU is an… environmentally responsible institution…".

THOMPSON RIVERS UNIVERSITY

Sustainability Office

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Sustainability Office
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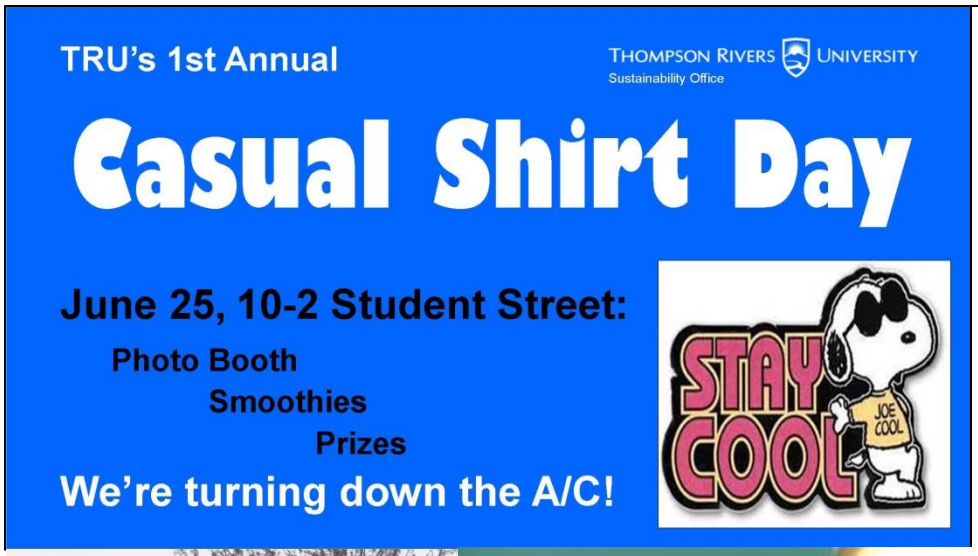


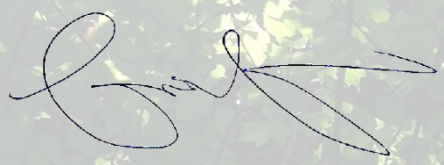
Images from various 2015 campus events and campaigns

1.0 Executive Summary

Thompson Rivers University identifies “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. Over the past year TRU continued to focus on energy reduction through numerous technical upgrades, and behaviour change programs. Waste diversion strategies, reducing paper use, and GHG emission reductions related to transportation were also key areas.

TRU’s Office of Environment and 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. The Director of the Office of Environment and Sustainability co-chairs the Higher Education Carbon Neutral Committee and represents the Advanced Education sector on the provincial Carbon Neutral Committee. TRU has been recognized as a leader in advancing sustainability and has been asked to present at several prestigious sustainability focused conferences. TRU receives funding through the Fortis BC Energy Specialist Program to employ a full-time Energy Specialist who started in July of 2013. In addition, the Office of Environment and Sustainability has a full-time Environmental Programs and Research Coordinator and routinely hires co-op or research students to assist with various initiatives and research.

Over the past five years energy consumption has been reduced by twenty five percent and 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 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 Office of Environment and Sustainability

2.1 Offsets Applied to Become Carbon Neutral in 2015

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 2015, TRU's emissions amounted to 3,384 tons of carbon dioxide equivalent (tCO_2e) and total offsets required were 3,375 tCO_2e.

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 2015 offsets were 3,375 tCO_2e, for a total offset investment of $84,375.00. 9 tCO_2e from Scope 1 (Fleet) did not require an offset payment. Those emissions (8.77 $BioCO_2$) were deemed offset exempt, or carbon neutral, as illustrated in the Totals table below.

Totals Calendar Year 2015, Thompson Rivers University

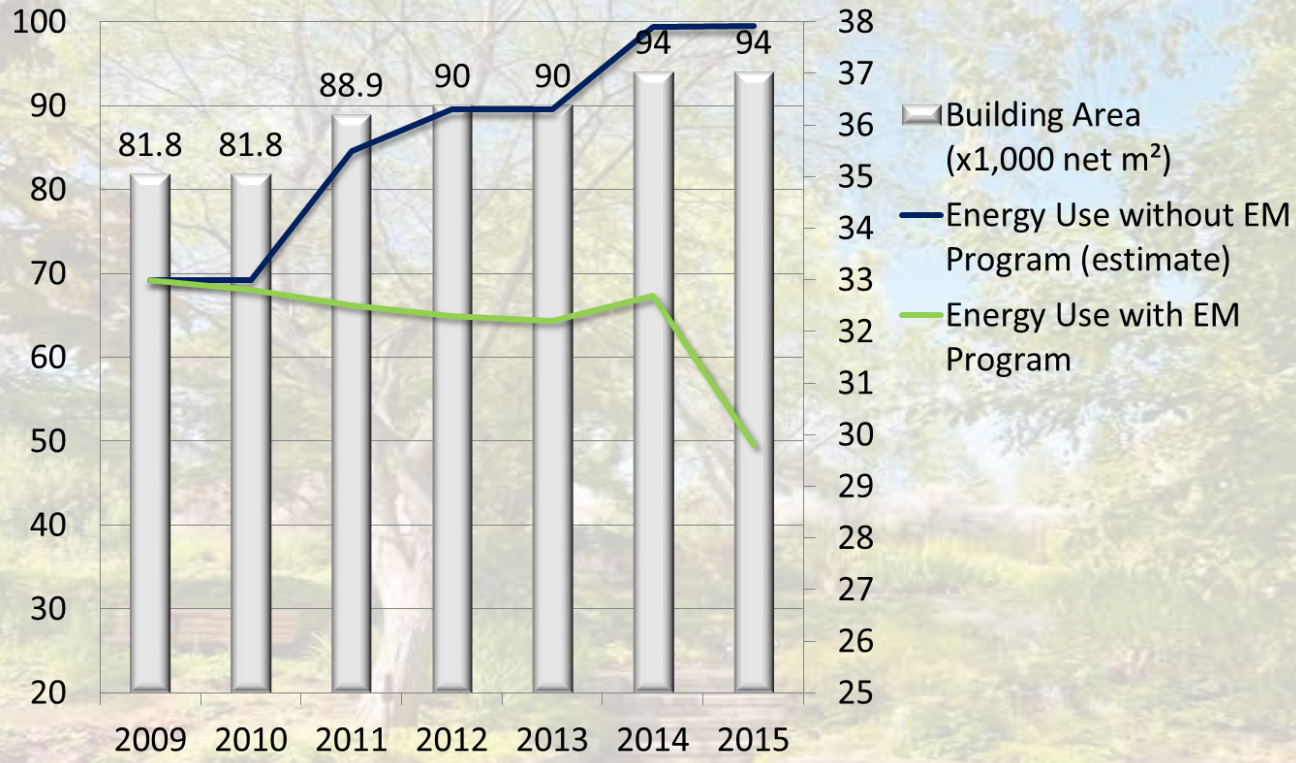
	Measure	Quantity	Greenhouse Gases in Tonnes				
			CO_2	$BioCO_2$	CH_4	N_2O	tCO_2e [1]
Scope 1 (Direct) Emissions							
Mobile Combustion (Fleet)	Litres	76,908.38	172.36	8.77	0.02	0.04	**192.02**
Stationary Combustion, Estimated [2]	GigaJoules	228.13	11.28	0.00	0.00	0.00	**11.35**
Stationary Combustion, Reported [3]	GigaJoules	59,505.00	2,942.99	0.00	0.06	0.05	**2,960.44**
Scope 2 (Indirect) Emissions							
Purchased Energy, Estimated [2]	GigaJoules	210.35	0.59	0.00	0.00	0.00	**0.59**
Purchased Energy, Reported [3]	GigaJoules	54,919.73	153.78	0.00	0.00	0.00	**153.78**
Scope 3 (Business Travel and Office Paper) Emissions							
Office Paper	Packages	11,226.10	65.53	0.00	0.00	0.00	**65.53**
Total Emissions, Calendar Year 2015			**3,346.53**	**8.77**	**0.08**	**0.09**	**3,384**
Carbon Neutral or Offset Exempt			**0.00**	**8.77**	**0.00**	**0.00**	**9**
Total for Offsets[4]			**3,346.53**	**0.00**	**0.08**	**0.09**	**3,375**

1. Each greenhouse gas has been converted to a standard measurement (tCO_2e) by multiplying its emissions by its global warming potential (GWP). The GWP of carbon dioxide (CO_2) from both anthropogenic and biogenic sources is 1; methane (CH_4) is 25, and nitrous oxide (N_2O) is 298. The Totals for tCO2e are shown here rounded to the nearest whole metric tonne as only whole tonnes of tCO2e 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_2e value from the "Total for Offsets" line represents the quantity of offset purchases required to become carbon neutral.

Energy Reduction Projects and Initiatives

Revolving Energy Fund

The Revolving Energy Fund (REF) was instrumental throughout 2015 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 25 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 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. 2015 saw the completion of additional buildings, bringing the total of completed buildings to 7, with 2 more currently in the implementation phase.

Boiler Replacements

In 2015 two large boilers were replaced with high efficiency condensing boilers in the Old Main Building, as well as one large boiler in the Science building. Funding through the Carbon Neutral Capital Program fund (CNCP) and the Fortis BC Efficient Boiler Program were instrumental in completing this project, which will contribute significantly to emission reductions.

Campus wide - LED Retro-fit

The entire campus has been retro-fitted to LED technology, including approximately 500 walkway, parking and street lights, and roughly 18,000 lamps including offices, hallways and classrooms. Table 6c illustrates the reductions in energy use per square foot.

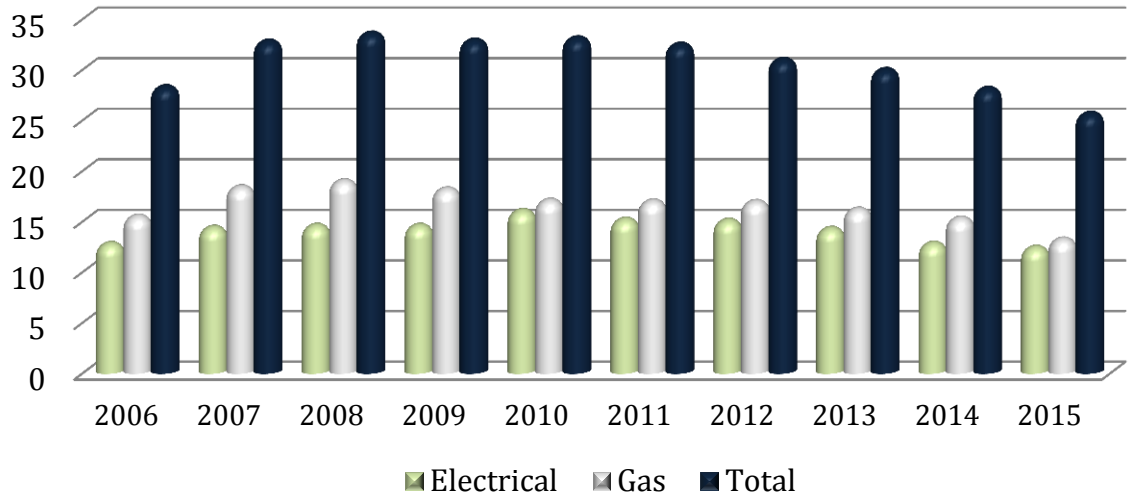


Table 6.c. Building Energy Performance Index (BEPI)

Sustainability Initiatives

Reductions in Paper use

TRU has aggressively reduced paper use on campus from 22 million sheets in 2012 to 9 million sheets in 2015, 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.

Second Composter Implemented

A second industrial in-vessel composter has been added resulting in diverting most organic materials at TRU from the landfill. The state of the art composters are running at capacity and diverting all cafeteria waste as well external functions such as weddings, convocation, ceremonies and events. Composting represents a closed loop feedback system at TRU. The finished product is used for enhancing the university grounds and is also available to any student, staff and faculty member to take home to their own gardens.

E- Waste

TRU has large recycling bins for larger electronics and has also partner with the Electronic Recycling Association to provide bins around campus, allowing staff and students to conveniently dispose of smaller electronics.

Styrofoam

TRU has implemented a Styrofoam recycling program that includes Styrofoam specific bins at key locations to ensure all Styrofoam packaging gets brought to the recycling center.

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. TRU has also become a member of the National Zero Waste Council. All events and functions on campus are now 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.

Waste Audit
In order to benchmark improvements in waste management practices, TRU now conducts yearly waste audits. The 2015 was audit identified a 42 percent diversion from landfill rate and a marked improvement comparted to prior years without zero waste infrastructure. The recent results of the 2016 waste audit indicate the new Zero Waste stations and increased composting program are proving effective, and diversion rates have increased to 65 percent.

Sustainability Office Ambassador Program
The Sustainability Office started its new Sustainability Ambassadors program in 2015. 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 lense'. 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.

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 reduse paper use, and then, if it is determined that printing has to take place, how to do so as efficiently as possible.

Energy Projects

Wood Bio-Mass Boiler for Williams Lake Campus

TRU is partnering 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 90 percent and will be commissioned in June of 2016. Bio-mass technology is also being considered for the Kamloops campus with a concept design, which may include up to 8 buildings, currently underway.

High Efficiency Boiler Upgrade

The Arts and Education Building will have existing boilers replaced with high efficiency boilers with an expected GHG reduction of 1 percent of the total campus.

Custom Design Program (BC Hydro, Fortis BC)

A custom design funding application will be completed by summer of 2015, and will include heat recovery, HVAC upgrades, fume hood upgrades and domestic water supply upgrades. Once complete, it is expected to result in an additional 2-3 percent reduction in energy use and GHG emissions.

Residences

The campus residences will undergo energy audits and retro-fits.

Sustainability Projects

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).

Sustainability Projects

Campus Community Engagement (continued)

Student to Student Sustainability Educators Program
This new program will roll-out in the fall of 2016. Students will have to apply to the program and selected applicants will go through a basic training before engaging is 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.

New Hybrid/Electric Fleet Vehicles, Start of New EV Maintenance Program, and Inclusion in Kamloops CarShare Program

After an analysis of regional travel by TRU staff and faculty, it was determined that in the long run TRU could save substantially on emissions and dollars by purchasing two new hybrids and a full electric vehicle, which it did in early 2016. Several fleet vehicles are also expected to be replaced with electric vehicles or hybrids later in 2016. On top of the savings, the TRU Trades and Technology department will now offer an electric vehicle maintenance course and service the EV fleet vehicle for free. Finally, when the three vehicles are not used for regional travel by staff or faculty, TRU students or other Kamloops community members who are formally registered with the new Kamloops CarShare program, can sign out the vehicles for use around the city.

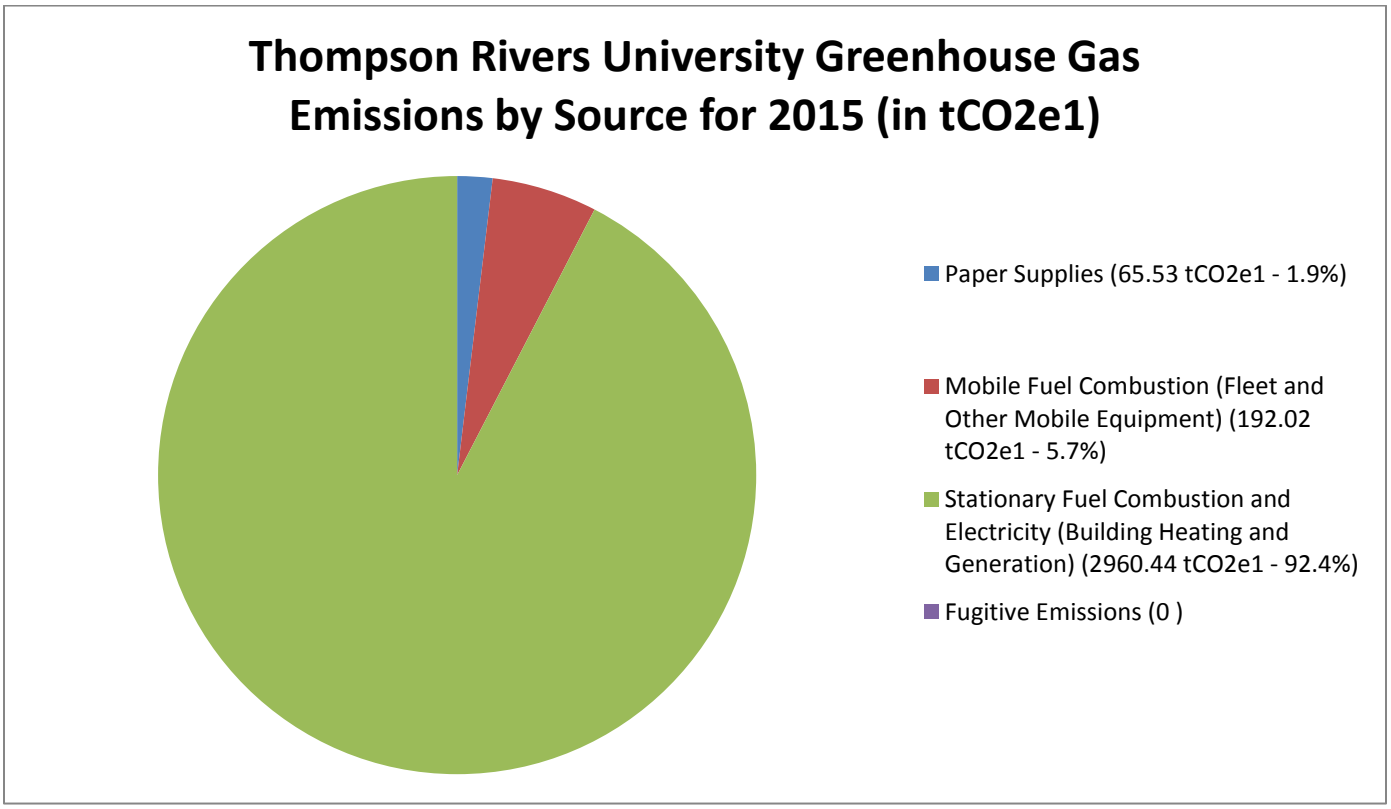
TEDx Event
The TRU Sustainability Office is working with a 2nd year student to host an official TEDx event during the 2016-2017 school year with the over-all theme of ‘social sustainability’.

New Waste Stream to Divert from Landfill

The next major waste diversion goal of the TRU Sustainability Office is to keep most construction and renovation waste from the landfill. The plan is to make sure contractors supply their own bins to source separate metal, wood and gyproc, which the City of Kamloops has recycling or reusing systems in place for.

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



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

Total offsets required: 3,375. Total offset Investment: $84,375.00.

Emissions not requiring offsets: 9**

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