



Royal Roads
UNIVERSITY

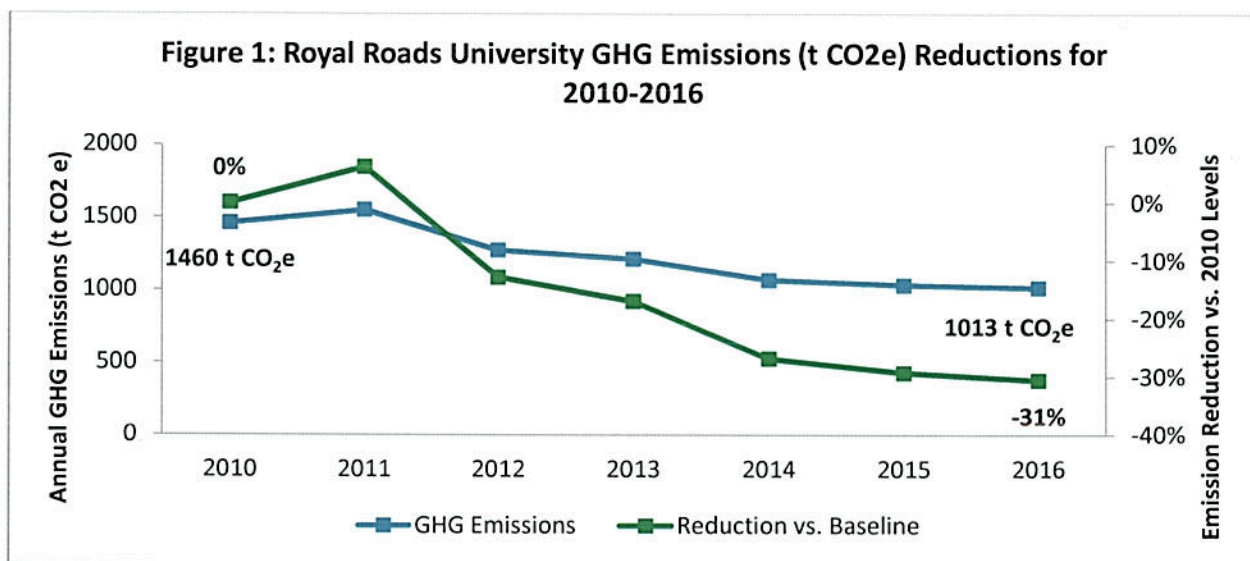
ROYAL ROADS UNIVERSITY

2016 CARBON NEUTRAL ACTION REPORT

LIFE.CHANGING

INTRODUCTION

Royal Roads University (Royal Roads) has achieved carbon neutral status and reduced greenhouse gas (GHG) emissions for the sixth consecutive year. In 2016, Royal Roads' total GHG emissions were reduced to 1,013 carbon dioxide equivalent tonnes (tCO₂e), which is an approximate 31% reduction from the total GHG emissions reported in 2010 (Figure 1).



Sustainability highlights for 2016 include successfully converting a significant portion of campus exterior lights to LEDs, which is expected to save \$13,576 in energy costs and two tonnes of CO₂e; renovating the library to improve overall building system and energy efficiencies; and increasing Royal Roads' waste diversion to 69%.

In 2016, Royal Roads was successful in its application for major capital funding from the Government of Canada's Post-Secondary Strategic Infrastructure Funding Program. Combined federal, provincial and private funding will create the \$24.3-million Centre for Environmental Science and International Partnership (CESIP). A combination of modern upgrades and construction of a new addition to the century-old Mews Building, a federally recognized heritage building, will align the building with Canada's and Royal Roads' climate change and sustainability goals by improving energy efficiency.

SUSTAINABILITY HIGHLIGHTS

Energy Conservation

Royal Roads integrates energy upgrades and sustainability initiatives into the university's capital infrastructure planning and project delivery process. Several initiatives were completed in 2016 that contributed to a reduction in GHG emissions produced on campus. These projects include boiler and direct digital control upgrades in the Millward Building, converting lights to LED lighting and replacing CO2 sensors.

The list of initiatives for 2016 and 2017 is provided in this report: *Actions Taken to Reduce Greenhouse Gas Emissions in 2016* and *Actions Planned to Continue to Reduce Greenhouse Gas Emissions in 2017*. Some of the significant projects for 2016 and 2017 that will improve energy conservation and reduce related GHG emissions include converting exterior lighting to LED lighting and renovating the Library, Mews Building and Boathouse.

Exterior LED Lighting

Royal Roads received a grant from the B.C. Carbon Neutral Capital Program which enabled the conversion of a large portion of campus exterior incandescent/florescent lights to low-energy LED lights to reduce energy consumption, enhance maintenance benefits and improve safety on campus. This project is expected to save \$13,576 in utility costs and two tonnes of CO2e. Royal Roads will save \$10,000 in maintenance costs due to the long life of the LED lights. Aside from energy conservation, the new lighting will also increase lighting reliability, improve light distribution on campus and provide better colour rendition to the campus.

Library Renovations

The Library underwent a second phase of renovations in 2016 and will continue to see energy upgrades in 2017. Renovations to the Library included:

- seismic upgrades,
- improvements to the electrical and mechanical systems including heating and cooling,
- installation of new, energy-efficient glazing throughout the building,
- renovations to the building interior including re-configuration of office spaces,
- installation of an elevator,
- installation of a drinking-water fountain in the kitchen which removes the need for water deliveries to the building, and
- replacement of the front entry with double-glazed units and two sets of double-entry doors with a heated space between to create a highly efficient entryway that is expected to reduce heat loss.

Centre for Environmental Science and International Partnership

Royal Roads received federal, provincial and private funding to build a new \$24.3-million living laboratory to foster innovation in research, sustainability and intercultural understanding. The project will breathe new life into Royal Roads' century-old Mews Building with a renovation and a new addition.



The entire building will be energy efficient to meet the federal government's requirements for green infrastructure. The heating will be provided by highly efficient condensing hot-water boilers distributed through an energy-efficient system of variable volume distribution boxes. To ensure further energy efficiencies are found, CO₂ sensors will be used to modulate the heat/air supply to the number of bodies occupying a space. Construction began in January 2017 and is expected to achieve substantial completion by April 30, 2018.

Boathouse Renovations

Also in 2017, the university initiated a project to upgrade the Boathouse, creating a Centre for Professional and Continuing Studies. Renovation work will involve enclosing the west end of the facility to create a new academic delivery space. In the process, building systems will be upgraded to improve energy efficiencies.

Project work will include improving air barrier and insulation, replacing doors and windows, insulating the roof, and installing LED lights and occupancy sensors in classrooms. Plans include upgrades to the mechanical system and installation of a high-efficiency condensing gas boiler. This boiler will be 94% efficient which will potentially reduce the building's GHG emissions by 5.23 tonnes of CO₂e in 2018. In addition, a central air-handling unit will supply air, including the ventilation required by code, to Variable

Air Volume (VAV) units located in the individual spaces. These VAV units will include reheat coils to allow individual thermal control per zone. These units will be used in conjunction with demand control ventilation strategies.

CO2 sensors in each space will reduce the amount of outside air delivered to each space based on the actual occupancy at the time. In addition, occupancy sensors will be used to close the VAV units when the spaces are unoccupied. Both of these strategies will reduce the overall heating load of the building in keeping with the rest of campus. The building will not be air conditioned.

Sustainability Initiatives

In addition to the building retrofits and energy upgrades through the university's capital infrastructure program, several smaller sustainability projects and initiatives at Royal Roads fostered a culture of change and encouraged positive environmental outcomes.

Sustainability initiatives undertaken in 2016 included conducting a new waste audit; continuing the bike rental program, which has been successful in its second year of operation; and applying and receiving funding for a bird conservation project that will lead to a bird-friendly campus.

Initiatives planned for 2017 to continue to meet the university's sustainability targets are outlined in Royal Roads' [2015-2020 Sustainability Plan](#). These include installing outdoor multi-stream recycling units to increase waste diversion; undertaking a pilot study for bird conservation; and organizing Sustainability Awareness Week to raise awareness about environmental issues.

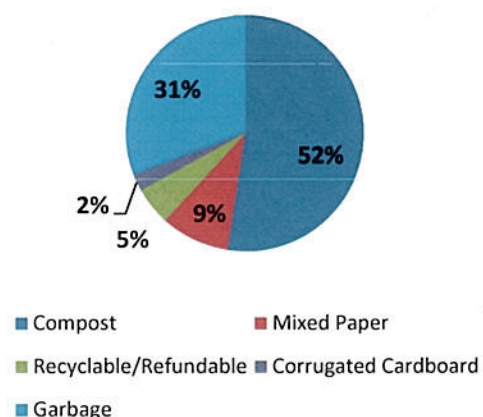
2016 Waste Audit

A total of 500 bags of garbage, mixed paper, recyclables/refundables and compost were weighed during the 2016 Waste Audit. Of those bags, a total of 179 bags were opened, sorted and analyzed. According to the data gathered, **Royal Roads' overall waste diversion rate was 69%**, which signifies a 6% improvement from the 2013 Waste Audit results and brings the university closer to its target of 80% diversion by 2020.

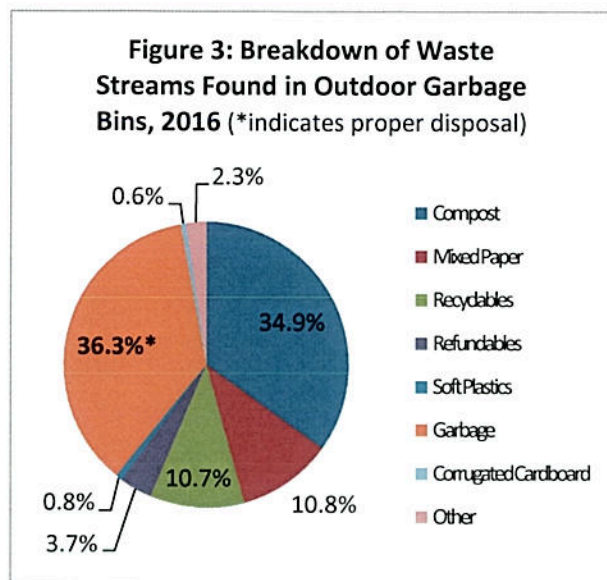
Compost has been a top priority for a change in the system; specifically, to encourage staff, faculty and students to divert more of the waste stream to the compost stream. The 2016 results have shown that the diversion of waste to the compost stream has increased. Compost comprises the majority of the waste produced on campus at 52%: an increase from 38% reported in 2013. The overall breakdown of the individual waste streams analyzed is presented in Figure 2.

Overall, approximately 48% of the waste analyzed was improperly disposed. Specifically, garbage had 20%

Figure 2: Overall Breakdown (%) of Individual Waste Streams, 2016



proper disposal, mixed paper had 90% proper disposal, and recyclables/refundables had 82% proper disposal.



In addition to the overall waste diversion rate, the waste audit measured the composition of waste in the outdoor bin system. The outdoor waste bins were identified as one of the largest sources of cross-contamination on campus due to the lack of sorting options as the outdoor waste bin system consists primarily of bins dedicated as garbage only.

The overall waste diversion rate for the outdoor waste bin system was only 8%. Of the outdoor garbage bins analyzed, approximately 63.7% of the waste was improperly disposed of with compost comprising 34.9% of the improper disposal (see Figure 3).

The audit outlined a number of recommendations on how to improve the waste management system and improve waste diversion to achieve Royal Roads' goals. Initiatives planned for 2017 include updating the university's [sustainability webpages](#) to provide up-to-date information on the recycling program at the university. This includes resources that students, staff and faculty can access to help reduce waste consumption. One of the findings of the waste audit was the lack of consistency between the branding on recycling bins and in buildings. Royal Roads will aim to continue rebranding bins for more consistency throughout campus.



Royal Roads conducted a waste audit in 2016 to determine the current rate of waste diversion and whether waste diversion is on target to reach the university's goal of 80% diversion by 2020.

To improve the outdoor waste bin system, two multi-stream recycling units with dedicated streams for compost, recyclables and refundables have been placed on campus with the goal of sorting more of the outdoor garbage to the compost and recyclables stream. This action is expected to improve the university's overall waste diversion. The outdoor units will be monitored in 2017 to determine their effectiveness and an updated waste audit will be completed by the Office of Sustainability in the fall of 2017 to determine if the new bins have improved the waste diversion rate of the outdoor waste bin system.

The outdoor waste bin system is considered one of the largest sources of cross-contamination on campus due to the lack of sorting options. To reduce cross-contamination, new multi-stream outdoor waste units have been placed on campus with the goal of diverting more waste from the landfill.



Bird-Friendly Campus

Protecting the ecological integrity of the campus lands is essential to the university's stewardship responsibilities. One of the activities planned for 2017 is a pilot study for bird conservation on campus. Due to the forest cover surrounding many of the buildings on campus, the reflection of trees in building windows has resulted in birds striking the windows. The bird conservation project, made possible by the Sustainable Action for the Environment (SAFE) Fund, would entail attaching decals which reflect ultraviolet sunlight to the windows on two campus buildings. Royal Roads is home to a migratory bird sanctuary for both rare and endangered species. The bird conservation project will mitigate bird fatalities, protect bird species and make Royal Roads a bird-friendly campus.

The Office of Sustainability will monitor the project to determine the effectiveness of the decals in preventing bird strikes and explore the possibility of applying decals to other windows on campus buildings in the future.

Academic Programs, Student Orientation and Student Sustainability Initiatives

Sustainability awareness continues to be integrated into student orientation and academic programs at Royal Roads. Two cohorts of Bachelor of Commerce (BCOM) students undertook the Recycling Case Challenge in 2016 and generated excellent suggestions on how to increase recycling and composting on

campus. As well, Bachelor of Business Administration (BBA) students presented solutions to on-campus sustainability problems that could help achieve the university's sustainability goals. The BBA students also participated in Global Climate Change Week during the week of October 10 to 16, 2016. During the week, students participated in climate interactive events such as the world climate simulation and the world energy simulation. Events included commuter audits and discussion on the role Royal Roads can play in achieving the goals of the Paris Agreement of 2015. During the commuter audits, students were stationed at two main parking lots on campus for two days and provided commuter emissions audits for willing commuters. Commuters were given a sense of the emissions associated with their commute to Royal Roads and the option to purchase offsets in the form of donations to the SAFE Fund equivalent to the cost of offsetting their daily, weekly, monthly or annual commute. The goal was to raise awareness about emissions from vehicles and inspire behaviour change.

To raise awareness about vehicular emissions, Bachelor of Business Administration students conducted commuter audits during Global Climate Change Week. Commuters were offered the option to donate the cost of their commute to the SAFE Fund.



The Office of Sustainability continues to partner with the Bachelor of Science (BSc) in Environmental Science program to sponsor student projects on sustainability initiatives relevant to the Royal Roads campus. A BSc student project was completed in 2016 on Royal Roads' fleet vehicles specifically to identify the cause of an increase in fleet vehicle emissions over the past five years while overall emissions have been decreasing (Table 1). The project reviewed the current fleet vehicles on campus, researched and proposed a fleet management system that would assist in meeting emission reduction targets, and provided recommendations on how to reduce fleet vehicle emissions to reduce the university's total emissions and offsets paid to become carbon neutral.

Table 1: Breakdown of tCO₂e Emissions at RRU¹

Year	Total Emissions (tCO₂e)	Emissions from Mobile Fuel Combustion (tCO₂e)	Percent of Emissions from Mobile Fuel Combustion (%)
2010	1,463	58.4	4
2011	1,550	61.88	4
2012	1,272	48.34	3.8
2013	1,212	76.17	6.3
2014	1,068	79.03	7.4
2015	1,032	74.00	7.2

Two BSc student projects were approved for the 2017 academic year. A workplace power audit project will study the electric loads produced by plug-in electrical devices and raise awareness about the power draw of plug-in devices and their contribution to a building's energy load. Along with this project, Royal Roads has continued replacing 1500-watt plug-in heaters used at desks with highly efficient heaters rated at 150 watts. The second project is a partnership with Rocky Point Bird Observatory to develop a bird-friendly certification program for businesses and apply the program to certify Royal Roads as a bird-friendly campus.

The Office of Sustainability participated in Campus Connect, an information fair for new students in fall 2016. The booth promoted sustainability initiatives on campus including the bike rental program, the Student Sustainability Committee and the recycling program.

In addition, the Office of Sustainability was involved in orientation programs for new students. Students participated in Minute to Win It activities as part of the September 2016 orientation for incoming international students. The event included a number of activities that teams of students participated in, including two that the Office of Sustainability hosted: a recycling challenge and a native species identification challenge. The various sustainability initiatives on campus have also been incorporated in the online student orientation materials. These materials were updated and enhanced in 2016 to include a section dedicated to sustainability at Royal Roads.

The Royal Roads Student Sustainability Committee promoted positive environmental change on campus and organized important sustainability initiatives on- and off-campus in 2016. Most notable among these initiatives was the committee's participation in Creatively United for the Planet where they shared their sustainability experiences at Royal Roads with others. In addition, the committee organized Sweater Day to raise awareness about energy conservation, and Earth Day to promote environmental stewardship of the Earth. The Student Sustainability Committee also co-sponsored the Global Climate Change Week events that occurred in October 2016 with members volunteering to conduct commuter audits. The committee has also been an advocate for a bird-friendly campus.

¹ Royal Environmental. (2016). Reducing Fleet Vehicles at RRU, Bachelor of Science in Environmental Science; Major Project.

The Royal Roads Student Sustainability Committee participated in Creatively United for the Planet, one of Canada's biggest sustainability events celebrating sustainability through the arts and creativity. The committee offered individuals the chance to express "what sustainability meant to them" through sustainable painting.



CONCLUSION

Royal Roads experienced another successful year in reducing GHG emissions. The energy conservation initiatives completed in 2016 have led to a 31% decrease in total GHG emissions reported since 2010 and move Royal Roads closer to the B.C. legislated target of 33% reduction by 2020.

The university will continue to monitor energy use, and identify and determine opportunities to improve the university's energy performance. This includes projects scheduled for 2017 that will further reduce the university's GHG emissions and strengthen its leadership in sustainability.

As the university continues to experience growth in both student population and building infrastructure, Royal Roads remains focused on reducing its environmental footprint in order to meet its sustainability targets for 2020.

Cheryl Eason,
Vice President and Chief Financial Officer
Royal Roads University

ACTIONS TAKEN TO REDUCE GREENHOUSE GAS EMISSIONS IN 2016

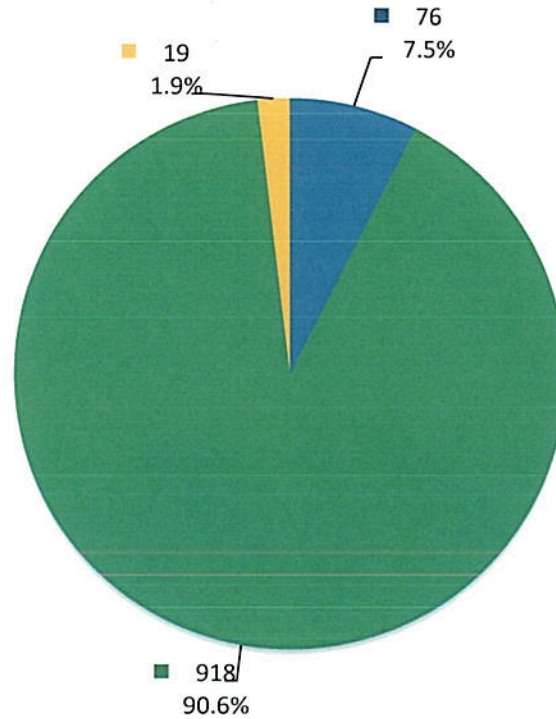
1. Undertook various energy conservation projects that included:
 - a. library renovated;
 - b. exterior LED lighting converted;
 - c. Millward Building boilers and direct digital control updated;
 - d. Grant Building direct digital-control system optimized;
 - e. Nixon Building steam-boiler renewed and a new, highly efficient system installed;
 - f. steam traps refurbished for the campus buildings that use steam heating systems;
 - g. new re-circulation line for the Millward Building solar hot-water system completed;
 - h. LED lights installed in the Cedar Building classrooms and loft area, in Hatley Castle chandeliers and in the Arbutus Building;
 - i. piping infrastructure (connected with building water distribution systems) repaired which greatly reduced inefficiencies and water loss;
 - j. five-year old failing CO2 sensors (76) in the Learning & Innovation Centre replaced and the system fully rebalanced to optimize the system and ensure it was operating as per design; and
 - k. control room for Building 7B newly created to serve as a central hub for everyone and a place for maintenance manuals.
2. Continued to replace the 1500-watt plug-in heaters used at desks with highly efficient heaters rated at 150 watts.
3. Conducted a waste audit to determine Royal Roads' overall waste diversion rate, whether the waste management system has been effective in diverting waste from the landfill, and to identify opportunities for improvement. The waste diversion rate was determined to be at 69%.
4. Received approval and funding for two new outdoor multi-stream recycling units with the goal of improving the university's waste diversion rate to 80%.
5. Continued the Office of Sustainability Recycling Case Challenge with the Bachelor of Commerce students to develop recommendations for improving recycling and composting at Royal Roads.
6. Completed the Bachelor of Science in Environmental Science student project to study the fleet vehicle emissions on campus.
7. Approved two new Bachelor of Science student projects for 2017. The first is a workplace power audit project which will study the electric loads produced by plug-in electrical devices. The second is a partnership with Rocky Point Bird Observatory to develop a bird-friendly certification program for businesses and apply the program to certify Royal Roads as a bird-friendly campus.
8. Received funding for bird decals to be attached to campus building windows to prevent bird strikes as part of the bird conservation project.
9. Included a campus guidebook, *Experience Royal Roads University Beyond the Classroom*, in orientation for staff, faculty and students and posted it on the sustainability website.
10. Successfully operated the Royal Roads bike-rental program.
11. The Office of Sustainability participated in the international student orientation with sustainability-focused challenges.

12. Launched a new online student orientation program that includes new sections on sustainability: a quiz with sustainability focused questions and a section on "What YOU can do" to reduce your impact at Royal Roads and on the world.
13. The Royal Roads Student Sustainability Committee coordinated and participated in Sweater Day, Creatively United for the Planet and Earth Day.
14. The Bachelor of Business Administration students participated in Global Climate Change Week that included conducting commuter audits to raise awareness about emissions related to vehicles. Commuters to campus were given the option to offset their commute by donating to the Sustainable Action for the Environment Fund.

ACTIONS PLANNED TO CONTINUE TO REDUCE GREENHOUSE GAS EMISSIONS IN 2017

1. Focus on the following initiatives :
 - a. install new condensing boilers, direct digital controls, radiator valves and room sensors in Hatley Castle;
 - b. replace existing hot water tanks when they fail with more efficient hot-water systems;
 - c. install LED lights in the Grant Building, Millward/Nixon Building, and Hatley Castle museum and gift shop;
 - d. install LED lights in emergency lighting system;
 - e. complete upgrades to campus exterior lighting; and
 - f. implement policies and awareness to greatly reduce energy loads from plug-in electrical devices, as identified in the workspace power audit.
2. Upgrade the Boathouse to reduce GHG emissions. Project work to include a high-efficiency condensing gas boiler; air barrier and insulation of walls and new frame walls; new double-glazed windows; new shear plywood and insulation of the roof; a variable air volume unit; and new LED lights.
3. Continue with construction on the university's Centre for Environmental Science and International Partnership. The building will align with Canada's and Royal Roads' climate change and sustainability goals by improving energy efficiency. The building will include condensing boilers; all new controls; central vacuum system for lab equipment which is more efficient than the system in Royal Roads' existing lab facilities; fume hoods with velocity ranging from 80cfm to 60cfm; LED lights; daylight controls; CO2 sensors; office plugs which turn off when load is switched off; three hydration stations; and high UV solar gain windows.
4. Continue to monitor energy, fleet and paper use during the year to reduce GHG emissions and improve energy conservation.
5. Install new outdoor multi-stream recycling units with branding consistent with the indoor recycling system.
6. Undertake a waste audit to analyze the new outdoor multi-stream recycling units to determine their effectiveness in diverting waste in the outdoor waste system which is considered to be the largest source of cross-contamination on campus.
7. Implement Sustainability Awareness Week during the week leading up to Earth Day.
8. Review the two completed Bachelor of Science student projects and the recommendations proposed to determine their applicability to Royal Roads.
9. Submit project proposals for new Bachelor of Science projects for the 2018 academic year.
10. Implement the bird conservation project by installing decals on campus building windows to reduce bird strikes for a more bird-friendly campus.
11. Continue to monitor the bike rental program and purchase additional bikes.
12. Work with the Student Sustainability Committee on sustainability initiatives including Earth Day and a *Green Guide* for students.
13. Continue the Recycling Case Challenge with Bachelor of Commerce students.
14. Update the sustainability website to include up-to-date information on the recycling program and other sustainability initiatives.

**Royal Roads University
Greenhouse Gas Emissions by Source
for the 2016 Calendar Year (tCO₂e*)**



Total Emissions: 1,013

- 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 April 05, 2017 12:59 PM)

Total offsets required: **1,010**. Total offset investment: **\$25,250**. Emissions which do not require offsets: **2**

*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

SMARTTool Greenhouse Gas Inventory Report

Reporting Entity: Royal Roads University

Reporting Year: Calendar Year 2016

		Greenhouse Gases in Tonnes					
	Measure	Quantity	CO ₂	CH ₄	N ₂ O	tCO ₂ e ¹	
Scope 1 (Direct) Emissions							
	Mobile Combustion (Fleet)	Litres	30,586.63	68.56	0.01	0.02	73.53
	Stationary Combustion, Reported ³	GigaJoules	17,748.71	880.70	0.02	0.02	886.02
Total Scope 1 Emissions			949.26	0.02	0.03	959.54	
Scope 2 (Indirect) Emissions							
	Purchased Energy, Reported ³	GigaJoules	10,744.97	32.23	0.00	0.00	32.23
Total Scope 2 Emissions			32.23	0.00	0.00	32.23	
Scope 3 Emissions							
Business Travel and Office Paper							
	Office Paper	Packages	3,075.00	18.60	0.00	0.00	18.60
Total Scope 3 Emissions			18.60	0.00	0.00	18.60	
Emissions from Biomass							
Total Biomass Emissions			2.50	0.00	0.00	2.50	
Total Emissions, Calendar Year 2016			1,002.59	0.02	0.03	1,012.88	

1. Global Warming Potential (GWP) has been applied only to the tCO₂e values.

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.

This information is provided by the Government of British Columbia, and is subject to verification.

CNAR OVERVIEW

Title: 2016 Carbon Neutral Action Report

Organization Name: Royal Roads University

Declaration Statement: This *Carbon Neutral Action Report* for the period January 1, 2016 to December 31, 2016 summarizes Royal Roads' emissions profile, the total offsets to reach net-zero emissions, the actions taken in 2016 to reduce greenhouse gas emissions, as well as plans to continue reducing emissions in 2017 and beyond.

By June 30, 2017, the final *Carbon Neutral Action Report* will be posted to the university's website at <http://www.royalroads.ca/about/plans-reports>.

Overview: Royal Roads continues to exemplify leadership in sustainability and in reducing its greenhouse gas emissions.

Through the university's capital infrastructure program, energy actions taken in 2016 included:

- updating boilers and direct digital controls for the heating system in the Millward Building,
- refurbishing steam traps,
- completing work on the re-circulation line for the solar hot-water system in the Millward Building,
- installing LED lights in the Cedar and Arbutus buildings and in the chandeliers in Hatley Castle, and
- renovating the library to increase energy efficiency and improve heating.

Royal Roads received a grant from the B.C. Carbon Neutral Capital Program which enabled the conversion of a large portion of campus exterior incandescent/florescent lights to low-energy LED lights. The project is expected to save \$13,576 in utility costs and two tonnes of CO₂e. The university will save \$10,000 in maintenance costs due to the long life of the LED lights.

Royal Roads will continue to reduce its GHG emissions in 2017 by focusing on infrastructure initiatives such as building retrofits and upgrades. These include:

- a new boiler system, direct digital controls, radiator valves and room sensors in Hatley Castle,
- interior and exterior light conversion to LED, and
- upgrades to the Boathouse.

The major capital initiative to create the \$24.3-million Centre for Environmental Science and International Partnership will involve modern upgrades to the century-old Mews Building and a new addition to improve energy efficiency. The result will be a building that aligns with Canada's and Royal Roads' climate change and sustainability goals. Construction began in 2017 and is expected to achieve substantial completion by April 30, 2018.

Emissions and Offset Summary Table:

[The final values to complete this table will be available on your SMARTTool Home page by May 15, 2017.]

Royal Roads University GHG Emissions and Offset for 2016 (tCO ₂ e)

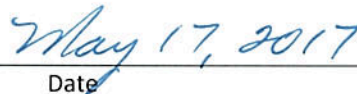
GHG Emissions created in Calendar Year 2016:	
Total Emissions (tCO ₂ e)	1,013
Total Offsets (tCO ₂ e)	1,010
Adjustments to GHG Emissions Reported in Prior Years:	
Total Emissions (tCO ₂ e)	0
Total Offsets (tCO ₂ e)	1,010
Grand Total Offsets for the 2016 Reporting Year:	
Grand Total Offsets (tCO ₂ e)	1,010

Retirement of Offsets:

In accordance with the requirements of the *Greenhouse Gas Reduction Targets Act* and Carbon Neutral Government Regulation, Royal Roads University 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. Royal Roads University hereby agrees that, in exchange for the Ministry of Environment ensuring that these offsets are retired on the university's behalf, Royal Roads University 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.

Executive sign-off:


Signature


Date

Cheryl Eason

Vice President & Chief Financial Officer
Royal Roads University

Name (please print)

Title

2016 Carbon Neutral Action Report Survey

Part One (external)

Contact Name(s):

Nancy Wilkin

Organization Name:

Royal Roads University

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.: Approximately 8 buildings underwent retrofits in 2016

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

Royal Roads integrates energy upgrades and sustainability initiatives into the university's capital infrastructure planning and project delivery process. As well, Royal Roads has an Energy Working Group which keeps a list of energy projects for campus and the list is continually updated and projects are completed as funding becomes available. Initiatives planned for future years include:

- upgrades to the boilers, controls, and heat pumps and replacement of all lighting in the Recreation Centre;*
- installing new condensing boilers, direct digital controls, radiator valves and room sensors in Hatley Castle;*
- replacing existing hot water tanks when they fail with more efficient hot-water systems;*
- installing LED lights in the Grant Building, Millward/Nixon Building, and Hatley Castle museum and gift shop;*
- converting emergency lighting system to LED lights;*
- completing upgrades to campus exterior lighting;*
- replacing the 1500-watt plug-in heaters with energy efficient heaters rated at 150 watts;*
- implementing policies and awareness to greatly reduce energy loads from plug-in electrical devices, as identified in the workspace power audit; and*
- renovations to the Mews Building, Boathouse, and Library will improve energy-efficiency and reduce GHG emissions.*

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

- Took steps to drive less than previous years.
- Other actions? Please describe briefly.: Sponsored a Bachelor of Science in Environmental Science project to study Royal Roads' fleet vehicle emissions.

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

Implement recommendations outlined in the Bachelor of Science in Environmental Science student project on reducing Royal Roads' fleet vehicle emissions including replacing existing vehicles with fuel-efficient vehicles; installing a fleet management system in fleet vehicles that would assist in meeting emission reduction targets; and implementing driver training for fleet vehicle users to alter driver behaviour.

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

-
- Awareness campaign focused on reducing office paper use.
 - Policy requiring the purchase of recycled content paper.: RRU purchases 30% recycled content paper
 - Other actions? Please describe briefly.: Printer defaulted to double-sided printing; increase in on-line course materials and submission of student assignments electronically

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

Royal Roads' 5-year Sustainability Plan outlines targets to reduce printing and single-sided printing, in addition to the purchase of alternative paper products with lower GHG emissions. Continue to incorporate the cost of alternative paper products into the Office of Sustainability budget. Develop a purchasing policy which would guide the university to purchase more sustainable products and services, including paper products.

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)
-
- Encouraged or allowed teleworking or working from home

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)
-
- Supported or provided education to staff about the science of climate change, conservation of water, energy and/or raw materials
-
- Other, please describe briefly: Sustainability awareness continues to be integrated into student orientation and academic programs at Royal Roads

Other Sustainability Actions:

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

Select all that apply

-
- A water conservation strategy which may include a plan or policy for replacing water fixtures with efficient models
-
- 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
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- Green procurement standards for goods (e.g., office furniture, etc.)
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- Lifecycle costing of new construction or renovations