

Royal Roads UNIVERSITY

2012 Carbon Neutral Action Report



ROYAL ROADS UNIVERSITY – 2012 CARBON NEUTRAL ACTION REPORT

OVERVIEW

EXECUTIVE SUMMARY

Sustainability actions continue at Royal Roads University (RRU). The highlight of the year was a nearly 20% reduction in emissions from 2011, with the majority of these reductions coming from the university's extensive retrofit program of campus building systems. Royal Roads' retrofit program included work on several heritage buildings and its success clearly demonstrates that the installation of energy efficiency upgrades directly reduces emissions.

In the fall of 2012, RRU was recognized as the only public-sector organization with an unqualified audit of greenhouse gas emissions reporting. The audit was undertaken as part of the BC government's verification of the emissions process, and the auditors concluded: "Based on our review, nothing has come to our attention that causes us to believe that the consumption data for the year ending December 31, 2011 is not, in all material respects, in accordance with the Regulation." This was tremendous news for those staff and executive members involved in the greenhouse gas emissions reporting at Royal Roads.

Another highlight from 2012 was the RRU Foundation's approval to join *1% for the Planet*. Following research to ensure the credibility and alignment with the *1% for the Planet* environmental criteria, RRU became eligible for support by the more than 1,300 businesses currently members in *1% for the Planet*. These members have clear environmental objectives and a track record of effective environmental initiatives. RRU is proud to be recognized by this group of sustainable companies.

RRU will also become part of the EV Charging Station network across British Columbia. Two Level 2 Electric Vehicle Charging Stations were approved, and the university was successful in receiving an \$8,000 grant under the province's Community Charging Infrastructure Fund. In addition, these two charging stations will be also be supported by funding from the Solar Colwood program.

Throughout 2012, the emphasis for reducing greenhouse gas emissions was on energy management. With the assistance of a new Energy Manager funded by BC Hydro, and a new Energy Specialist funded by FortisBC, both shared with Camosun College, the university is now tracking its energy use quarterly. The results are impressive with a reduction of over 15% from 2011. In addition, an energy committee has been created, which meets quarterly to look for additional energy savings. An Energy Success Story for RRU is that the year 2012 marks the first time the university has had *ZERO* heating fuel oil delivered to campus. Previously four houses

on campus had oil tanks and oil furnaces. These were replaced over 2010 and 2011 with high-efficiency heat pump systems, with a savings of 10,306 litres of heating fuel, which is no longer being delivered to the university.

The plan for the coming year is to initiate an energy conservation program on campus, with emphasis on workstation efficiencies and individual department carbon footprint analysis. In 2012, the IT department designed the capability for the campus to track an individual's printing usage, and therefore paper usage. Staff and faculty now receive a quarterly report outlining their current paper use and their previous use. This is a very effective tool in bringing awareness to staff about their paper use and the need to reduce it, and therefore reduce our greenhouse gas emissions.

Operations staff attended energy efficiency workshops, sponsored by Natural Resources Canada and FortisBC, and have taken direct action in adjusting heating levels in the buildings on campus, and are working with Campus Services to better align classroom use and heating/lighting needs. A continuous optimization system should be in place by the end of 2013 based on this initial work done in 2012.

Plans for 2013 also include a feasibility study to look at the business case for alternative energy systems at RRU, in particular geothermal, which could significantly reduce the university's emissions. This system is currently being used by a neighbouring development.

STEWARDSHIP OF THE NATIONAL HISTORIC SITE

Royal Roads University is situated on the grounds of the Hatley Park National Historic Site. The university has the responsibility to be "A leader for sustainable stewardship of our historic lands." (RRU Strategic Direction, January 2012). The site has ornamental gardens, an Edwardian castle, fish-bearing streams, a migratory bird sanctuary, old growth forests, wetlands, and historical pastoral landscapes. In 2012, RRU joined with the Capital Regional District (CRD) and installed a stream flow monitor on Colwood Creek, as part of the region's harbour monitoring program. There is also regular water quality testing being done by the CRD on Colwood Creek as part of this program. RRU is also a member of the Esquimalt Lagoon Stewardship Initiative (ELSI), a community organization supported by the CRD which regularly monitors the entire watershed, including Esquimalt Lagoon and the Coburg Peninsula located directly across from the university.

TRANSPORTATION ON CAMPUS

The RRU campus plan has a goal for the campus to become more pedestrian friendly, and this vision became a reality in 2012, with the infusion of \$2.1 million dollars from the Province of BC, for life-safety civil work on campus. This work has created separated pathways throughout the campus, improved the road travel network on campus, re-built a major artery supported by a critical retaining wall system, and improved directional and safety signage. A new bus loop

was also constructed, and will support the extension of BC Transit services which anticipates that local route #52, the Wishart bus to RRU, will offer the first-ever evening and weekend bus service to the campus. Work will continue into 2013, including improvements to the cycling infrastructure on campus.

A Bachelor of Science student project was approved to undertake a new transportation demand study for RRU. The last one was done in 2006, prior to the UPass which was put in place in 2011. It is expected that the number of students and staff using public transit will show an increase, and the number coming to campus in single occupant vehicles will decrease. The study will be complete in August 2013.

As noted previously, two Electric Vehicle Charging Stations were installed in the spring of 2013. One station will be at the Mews conference centre and the other one behind the Nixon building. Both will require a valid parking permit, but there will be no charge for the electricity. Funds will also be provided through the Solar Colwood program for these stations.

ACADEMIC PROGRAMS

A new Bachelor of Business Administration program has been approved, and will have administration and sustainability as its themes. In 2012, the Masters of Environmental Management had three cohorts devoted to the study of food security at RRU. Work continues on this topic, with two masters students studying the sustainability of farming in the surrounding area. Camosun College students, who undertake their horticulture practicum at RRU, have planted a successful vegetable garden in the Dunsmuir walled garden, and have added vegetable seedlings to their semi-annual plant sales.

A new student project was approved to undertake the Sustainability Tracking, Assessment and Rating System (STARS II) project. The university received a Silver Star for 2010, and there is optimism that this review will result in a Gold Star for 2013. These results will be ready in August 2013.

The Masters of Leadership Studies cohorts have all included a sustainability talk in their residencies, as well as the Bachelor of Commerce and Bachelor of Environmental Science programs. The Bachelor of Commerce students do a *Cars on Campus* challenge project each year, and make recommendations for reducing the number of single occupant vehicles coming to campus. A new carpooling policy will be implemented in 2013, based on many of the ideas coming from the Bachelor of Commerce student work.

SOLAR COLWOOD PARTNERSHIP

Royal Roads University has been a partner with the Solar Colwood program since 2011, and is responsible for monitoring the program and undertaking research. The monitoring program is

ongoing to March 2014, and the research will continue to December 2013, with the desire to extend the research to 2014.

As part of the research project, which is funded by the Pacific Institute for Climate Solutions, RRU faculty and research assistants have held focus groups in the community to undertake their project. In 2012, this research was extended to Dunsmuir Middle School. The purpose of the research is to determine the role of social diffusion in the adoption of energy efficiency upgrades to homes. The extension to the school students is a new part of the research, and its purpose is to determine the role that middle school students can play in the decisions by homeowners to join the Solar Colwood program, and have energy upgrades done in their homes. A Bachelor of Science student project was also approved in 2012, to assist with this research.

STUDENT ACTIVITIES

Each year the RRU Student Association (RRUSA) provides for a student sustainability committee. This group of undergraduate students is supported by the Office of Sustainability and undertakes activities such as National Sweater Day, Earth Hour, Earth Day, Westshore Earth Day, and other campus events. In addition, the students get involved in the CRD *Ready, Set, Solve* project, which is a volunteer contest to assist local governments and non-government organizations with climate change solutions. The winning team in the 2012 *Ready, Set, Solve* contest was from RRU, and each member of the team won \$500 towards their tuition. The program for 2013 is underway with an \$800 donation by the CRD into the RRU Sustainable Actions for the Environment (SAFE) fund.

RECYCLING/WASTE MANAGEMENT

A Bachelor of Science student project was approved to undertake a waste management audit of RRU. The last audit was done in 2004, which showed a 70% diversion rate of waste from RRU away from the landfill. The custodial staff at Royal Roads and the Truffles Catering staff are diligent about separating compost, garbage, recyclables, so there is optimism that this diversion rate will be improved. A new recycling station was approved in 2012 for the university's cafeteria, funded by the SAFE fund and the custodial staff's *pop bottle* fund. This station will profile the recycling program at RRU. The waste audit will also make recommendations regarding the current recycling units at the different buildings, and on the grounds at RRU. This project will be complete in August 2013. The university's Director of Sustainability regularly speaks at the beginning of student classes and graduate residencies to explain the recycling program at RRU, and in particular the program in the new LEED Gold Learning and Innovation Centre. These talks, and the continued support by the RRU faculty, have resulted in the system being properly implemented in the new building.

OTHER HIGHLIGHTS FOR 2012

RRU has participated in the CRD *Resilient Region Breakfast Series* which is a very successful sustainability networking event. The year-end event for 2012 included 170 local businesses in a session called *The New Business As Usual*. In addition to this networking series, RRU was also involved in the *Greater Victoria Regional Green Economy Initiative*, which is continuing with quarterly sessions throughout the region. RRU will be hosting one of these sessions in 2013. Participating in these programs enables RRU to highlight its role in applied research and community relations, and has also enabled a few key members of the faculty to attend and be profiled.

In 2012, the university signed a memorandum of understanding with the Sooke School District #62, to support a two-year pilot program called *Nature Kindergarten*. The students in the *Nature Kindergarten* use the RRU grounds as the site of their outdoor activities. The program is being monitored by early childhood educators, and an RRU student is undertaking a masters program project on this initiative. In addition, the RRU Continuing Studies department has designed the professional development program to support teachers interested in teaching education in an outdoor setting. The program has also attracted the support of the RRU grounds and garden staff, in providing guidance and knowledge about the RRU ecosystem. The *Nature Kindergarten* initiative highlights the importance of RRU's collaborative relationship with the community, and the many benefits that come from presenting the university as a *living laboratory*.



Dan Tulip,
Vice President & Chief Financial Officer

EMISSIONS REDUCTIONS ACTIVITIES

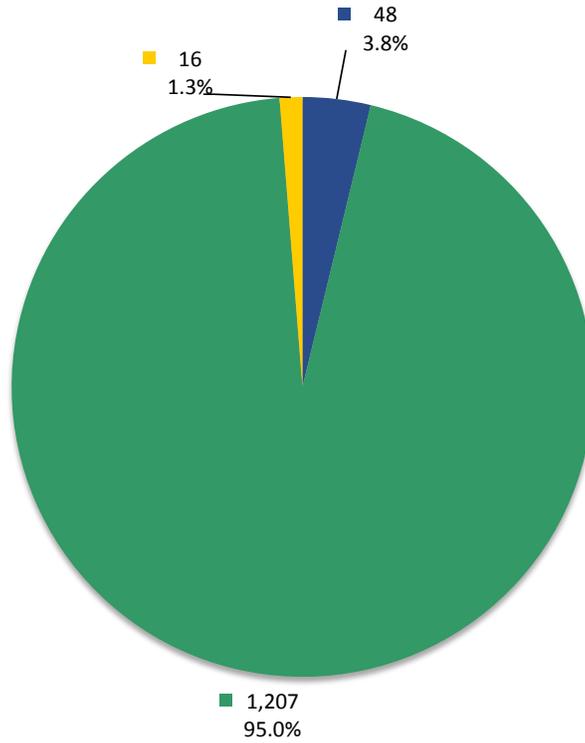
ACTIONS TAKEN TO REDUCE GREENHOUSE GAS EMISSIONS IN 2012

1. RRU has an Energy Manager, supported by BC Hydro, and shared with Camosun College. As part of the responsibilities of the Power Smart Energy Manager program, a Strategic Energy Management Plan was completed for the university. This plan highlights the following:
 - The Energy Team, Key Performance Indicators and GHG Emissions, Energy Policy, Energy Consumption and Costs, and Planned Actions.
 - The highlight of the plan is an overall energy savings of 15.4% since the 2007 baseline. This includes 20.1% savings in electricity, 100% savings in fuel oil, and 11.4% savings in natural gas.
 - The avoided costs from these energy savings was \$142,343, as of December 31, 2012.
 - The BC Hydro Power Smart team set up a display at the Habitat cafeteria to inform students, faculty and staff about the positive benefits of energy conservation.
2. RRU received approval for a part-time Energy Specialist, supported by FortisBC. This position is also shared with Camosun College. The focus for this position will be to complement the work of the Energy Manager, with emphasis on natural gas projects on campus, and assist the Office of Sustainability with a Campus Energy Conservation Program.
3. RRU was successful in its grant application to the BC government's Community Charging Infrastructure Fund. This grant is for \$8000 to support the installation of two Level 2 Electric Vehicle Charging Stations on campus. These stations are also supported by the Solar Colwood program.
4. The university's Physical & Environmental Resources Department has been diligent in adjusting the heating and cooling systems in each of the buildings on campus through the use of direct digital controls (DDC). These controls were installed as part of the PSECA funding RRU received in 2011.
5. RRU is moving towards being a more pedestrian-friendly campus, with the infusion of \$2.1 million dollars from the BC Government for life-safety civil work on campus. A number of roads were improved, and pathways created, separating pedestrians and vehicles. A new bus loop was also constructed, which will enable increased bus service to RRU, including evenings and weekends. This activity, along with improved cycling infrastructure on campus, will assist in reducing the number of single occupant vehicles coming to RRU.
6. The IT department created a quarterly personal printing volume report for all staff.
7. Two new Energy Star® Fridges, one Energy Star® Dishwasher, two microwaves and three bar fridges were purchased to replace older equipment.

PLANS TO CONTINUE REDUCING GREENHOUSE GAS EMISSIONS 2013-2015

1. Implementation of an Energy Conservation Program on campus, including a workstation energy efficiency tune up, and a carbon footprint calculation for departments.
2. Continuation of the Energy Manager and Energy Specialist program, and completion of building projects to save energy – such as the Continuous Optimization program, which will match classroom use and energy needs.
3. Two Electric Vehicle Charging Stations will be available for use to the staff, students, faculty and the public. These stations will require a valid parking permit, but there will be no charge for the electricity.
4. A demonstration of electric utility vehicles to determine the feasibility of replacing some of the existing fleet vehicles with electric vehicles.
5. The results of the Bachelor of Science student project on waste management will be completed, with recommendations for improving the university's waste diversion record.
6. The results of the Bachelor of Science student project on transportation demand at RRU will be completed, with recommendations on how to take action to continue to reduce the number of single occupant vehicles coming to campus.
7. Life-safety project work will be complete, improving pedestrian and cycling infrastructure, and the bus loop will be operational. As of September 2013, an additional bus will be coming to campus, which will provide Royal Roads with evenings and weekend service for the first time.
8. RRU will be re-assessed by STARS, as a result of the 2013 Bachelor of Science student project. A re-assessment will take place in 2014, based on the 2013 results.
9. Results of the Solar Colwood monitoring program and the social diffusion research will be complete in 2014.
10. A feasibility study will be underway on the potential for the university to use other energy sources and to continue additional energy upgrades, in order to reduce greenhouse gas emissions to meet the 2020 target for the public sector.
11. The new recycling station will be constructed in the Habitat cafeteria, and new compost bins will be installed on each of the floors in the new Learning and Innovation Centre. In addition, recycling units will be installed outside the buildings at RRU, including new compost bins.

**Royal Roads University
Greenhouse Gas Emissions by Source
for the 2012 Calendar Year (tCO₂e*)**



Total Emissions: 1,272

- 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 2012 (Generated May 10, 2013 10:44 AM)

Total offsets required: **1,270**. Total offset investment: **\$31,750**. 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 from the sources listed above must be reported. As outlined in the regulation, some emissions do not require offsets.

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Royal Roads University Greenhouse Gas Emissions Source Detail Report for the 2012 Calendar Year Generated May 10, 2013

Source		Quantity	Greenhouse Gases In Tonnes			
			CO ₂	CH ₄	N ₂ O	tCO ₂ e *
Stationary Fuel Combustion (Building Heating and Generators) and Electricity						
Offset Required	Fuel Combustion **	22,175.71 GJ	1,106.82	0.02	0.02	1,113.67
	Purchased Energy	10,190.71 GJ	93.57	0.00	0.00	93.57
	Offset Required Sub Total		1,200.39	0.02	0.02	1,207.25
Offset Exempt	CO ₂ from Biogenic Fuel Combustion		0.19	N/A	N/A	0.19
	Offset Exempt Sub Total		0.19	0.00	0.00	0.19
	TOTAL STATIONARY EMISSIONS		1,200.58	0.02	0.02	1,207
Mobile Fuel Combustion (Fleet and other mobile equipment)						
Offset Required	Fuel Combustion **	20,519.42 L	43.80	0.01	0.01	47.03
	Offset Required Sub Total		43.80	0.01	0.01	47.03
Offset Exempt	CO ₂ from Biogenic Fuel Combustion		1.42	N/A	N/A	1.42
	Offset Exempt Sub Total		1.42	0.00	0.00	1.42
	TOTAL MOBILE EMISSIONS		45.22	0.01	0.01	48
Supplies (Paper)						
Offset Required	Non-recycled Content Paper	15 Pkg	0.10	0.00	0.00	0.10
	Recycled Content Copy Paper	2,815 Pkg	16.05	0.00	0.00	16.05
	Offset Required Sub Total		16.15	0.00	0.00	16.15
	TOTAL SUPPLIES EMISSIONS		16.15	0.00	0.00	16
	Total Offset Exempt		1.61	0.00	0.00	2
	Total Offset Required		1,260.33	0.03	0.03	1,270
	TOTAL EMISSIONS		1,261.94	0.03	0.03	1,272

* Each greenhouse gas has been converted to a standard measurement (tCO₂e) by multiplying its emissions by its global warming potential (GWP).

The GWP of carbon dioxide (CO₂) from both anthropogenic and biogenic sources is 1; methane (CH₄) is 21, and nitrous oxide (N₂O) is 310.

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.

** Includes Fossil Fuels and CH₄ and N₂O from Biogenic Fuels

*** May 6, 2013 – A review by the BC government Carbon Measurement and Reporting Branch has identified an additional 17 tonnes of emissions from 2011 that need to be accounted for in this reporting year (2012).