

2011 Carbon Neutral Action Report

ROYAL ROADS UNIVERSITY – 2011 CARBON NEUTRAL ACTION REPORT

OVERVIEW

EXECUTIVE SUMMARY

The year 2011 was a significant one for Royal Roads University, with the opening of its first purpose-built LEED Gold academic building on campus – the Learning and Innovation Centre. The other major highlight for the year was the on-campus students voting in favour of the BC Transit U-Pass program. The year also marked an investment of over \$1 million dollars of Public Sector Energy Conservation Agreement dollars into energy retrofits in 92% of the existing buildings on campus, including a new energy efficient boiler for Hatley Castle, and a solar hot water system for the student residence building. The following is a summary of these and additional carbon neutral activities for the year 2011.

CLIMATE AND ENERGY ACTION AWARD

The Royal Roads Office of Sustainability, School of Environment and Sustainability and the City of Colwood won the 2011 Climate and Energy Action Award, presented at the Union of BC Municipalities meeting in September, 2011. This award, sponsored by the Community Energy Association was “In recognition of research and monitoring support provided to the development and operation of the Solar Colwood program through the *Green Learning in Action* Partnership.” This was a great accomplishment for the university and its partner the City of Colwood and marked a major recognition by the Union of BC Municipalities for collaboration on climate change initiatives.

RENEWAL OF ROYAL ROAD’S STRATEGIC DIRECTION

The year 2011 also marked a major renewal for the strategic direction of the university, with the following vision, mission and goals:

VISION: “We connect people, ideas and experiences to change lives and the world.”

MISSION: “We are leaders and partners creating an enduring prosperity. Transformation in career and life results from our teaching and research applied to solve problems and create opportunities in the world.”

GOALS:

- Demand-driven growth in high-quality, effective education and research that contribute to economic prosperity, social advancement, and environmental sustainability.
- The university of choice for relevant applied and professional education providing continuous opportunities to learn and transform lives and careers.
- A financially sustainable, high-performance organization.
- A workplace of choice supporting professional and personal success.
- A university with strong partnerships, responsive to our alumni and the communities we serve.
- A leader for sustainable stewardship of our historic lands.

As well, the previous commitments to reduce our greenhouse gas emissions by 50% by 2020, be carbon neutral by 2010 (accomplished), endeavour to be self-sufficient in energy, waste and water, and be a leader in sustainability are embedded in our 5-year Strategic Plan.

THE LEARNING AND INNOVATION CENTRE

Royal Roads University is also embarking on an aggressive growth strategy, with forecasts of 12% growth annually in student FTEs, with a growing percentage of international students, many of whom will be on campus. To accommodate this growth, the new Learning and Innovation Centre was opened in 2011, providing an additional 5,781 square meters of learning space for students. The LIC was built to Gold LEED standards and includes state-of-the-art technology to support RRU's innovative learning model. A "Centre for Dialogue" was created on the fourth floor of the LIC which incorporates specialized technology and furnishings to support RRU's outreach and participation in globally significant dialogue and learning opportunities through webcasts, live streaming, video conferencing and multimedia presentations.

The LIC includes a solar hot water system, which is very beneficial because the student/staff and faculty showers are located in the LIC, for cyclists and others. There are innovative water technologies, such as the collection of non-potable water to be reused for toilets and irrigation, which result in a water savings estimated at 1.7 million litres of water each year, and the system has the potential for treating wastewater on site. Seventy-five percent of the roof is highly reflective, thereby reducing heat absorption and addressing the potential heat island effect. During construction, 95% of the construction waste was diverted from the landfill. Following the construction, and the review from the consultants, the building was deemed to have created zero environmental impacts, particularly important because of the proximity to the fish bearing Colwood Creek.

The University also won an Excellence Award for the LIC, in the Institutional Category of the Commercial Building Awards, sponsored by the Commercial Division of the Victoria Real Estate Board.

RRU STUDENTS ADOPT THE BC TRANSIT UPASS

Another significant change at RRU in 2011 was the adoption of the U-Pass system by the on-campus student body – marking the first time the students have passed the required bylaw and referendum to increase their student fee, to enable the U-Pass (77% of on campus undergraduate students voted and of those, 83% voted in favour of the U-Pass program). A Transportation Demand Study was completed in 2007 which revealed that 90% of the students, staff and faculty were arriving at RRU in single-occupant vehicles. Since that time the university has started a number of initiatives to encourage carpooling, cycling and transit, however, the passing of the U-Pass has been the single most significant change. Ridership has increased on transit which should lead to increased service by BC Transit. In addition, to further improve access to transit, a bus turnaround station has been added to plans for developing the north end of campus which will accommodate more buses coming into campus and concentrate the transportation nodes for campus at the north end. Future residences are also being planned for this area, all part of the creation of the Upland Village.

ENERGY RETROFITS AT ROYAL ROADS

The majority of the buildings on the RRU campus were either part of the Dunsmuir Estate, for example Hatley Castle, or part of the military history of the site. RRU was fortunate to receive over \$1 million dollars in 2011 to undertake major retrofits of these buildings, as part of the plan to reduce greenhouse gas emissions by 50% by 2020. It is expected that these retrofits will reduce emissions by 20%. Retrofit actions included a new energy efficient boiler for Hatley Castle, air sealing and insulation for all of the buildings, significant upgrades to direct digital control systems, spark igniters for the gas stoves in the cafeteria, a new hot water boiler in the gymnasium, new LED and compact fluorescent units for all of the office desks and residences, as well as new shower heads throughout. Discussions are still underway on the feasibility of a district energy system for the university, and the potential of various alternative energy sources, such as wind, solar and geothermal.

ACADEMICS AND SUSTAINABILITY AT ROYAL ROADS

On the academic side, the university launched the first ever Carbon and Energy Leadership and Sustainable Community Development Certificates; completed two Bachelor of Science student projects, completed the first year of a Social Diffusion research project on the Solar Colwood project; and completed a transportation challenge project by the Bachelor of Commerce students.

RRU is a partner with the City of Colwood on the Solar Colwood project. This project is a \$3.9 million program, under Natural Resources Canada, which will result in 1,000 homes in Colwood undergoing energy assessments, and choosing either solar hot water systems or ductless split heat pumps, to decrease the greenhouse gas emissions in the City of Colwood.

The results of these two student projects are highlighted below:

1. **Monitoring Project:** This project represented leading-edge research into the energy use and GHG emissions at the household level. The main outcomes of the project were:
 - a. The identification of an information gap regarding energy use at the household and community level – which showed that only provincial level average information has been used in the past, which precludes the development of accurate energy use leading to accurate GHG emissions information, and
 - b. The development of a methodology for quantifying the energy use and GHG emissions reductions associated with retrofitting homes with solar hot water systems.
2. **Lifecycle Assessment of a Solar Thermal System:** The students conducted a lifecycle analysis (LCA) and a benefit-cost analysis (BCA) of a solar thermal hot water (SHW) system. The research project consisted of two objectives:
 - a. To calculate carbon dioxide (CO₂) emissions by using LCA applications, based on SHW system production and subsequent transportation to Vancouver Island; and,
 - b. To determine if Colwood homeowners should consider the Solar Colwood program by applying BCA methods based on financial savings, and social and environmental values.

Results for the first objective indicated that there was a net reduction in CO₂ emissions, especially for homeowners with hot water tanks originally heated by natural gas. Therefore, it was recommended that Colwood homeowners participate in the Solar Colwood program if they wish to apply SHW technology as a means to reducing their personal carbon footprint. Study findings for the second objective indicated that the homeowner financial benefits varied due to many influences, such as fuel inflation rates, current energy source used, and the various financial incentives in the Solar Colwood program. As a result, recommendations for Colwood homeowners were to evaluate their individual situation and determine their actual financial savings. The study also strongly recommended that homeowners consider the positive social and environmental benefits of participating in the SHW program.

In addition to these student projects, there is a two-year research study on the social diffusion aspects of Solar Colwood underway, funded by the Pacific Institute for Climate Solutions. A

number of barriers to the adoption of solar systems were identified, such as lack of awareness, installation concerns, lack of knowledge about energy efficiency options, the complexity of rebate programs, low energy prices, a mild climate and the perceived inability to capitalize energy efficiency improvements in home values. The benefits identified included taking action and demonstrating leadership, providing an example for a better future for young people and saving money through reduced energy costs. This study will continue through 2012, as well as three more Solar Colwood student projects in the Bachelor of Science program.

The learning model at Royal Roads University encourages and supports students working on real world challenges and opportunities. In this past year the focus has been on transportation in the Bachelor of Commerce program and on Solar Colwood in the Bachelor of Science program. 2012 will see a continuation of these programs, but also a new challenge area on food security and carbon in the Masters of Environmental Management program, and a Bachelor of Commerce Venture Challenge on the SAFE fund (Sustainability Actions for the Environment Fund).

OTHER HIGHLIGHTS AND WINNING RRU STUDENTS IN “READY, SET, SOLVE”

Other highlights from 2011 include the completion of the Wetland Assessment Report, a cycling survey of staff and faculty to help drive a new cycling infrastructure plan at RRU, and the highly successful *Ready, Set, Solve* Project, coordinated by a RRU alumni working for the goBEYOND Campus Climate Network as part of the Office of Sustainability at RRU, and won by a team of RRU students. The winning project was a Greenhouse Gas Emissions calculator for the Town of Sidney – the students volunteered their time over a three-month period, in a competition with students from UVIC and Camosun College. This project was sponsored by the Capital Region District and BC Hydro. Another shining example of RRU students undertaking real world challenges for the benefit of sustainability in the larger community.



Dan Tulip,
Vice President and Chief Financial Officer
Royal Roads University

EMISSIONS REDUCTIONS ACTIVITIES

ACTIONS TAKEN TO REDUCE GREENHOUSE GAS EMISSIONS IN 2011

1. RRU completed a number of Energy Upgrades to its buildings in 2011, with the support of over \$1 million from the Public Sector Energy Conservation Agreement. Projects completed include:
 - A new energy efficient boiler for Hatley Castle
 - Air sealing and insulation in 16 buildings
 - Attic insulation in Hatley Castle
 - Digital control systems installed in nine buildings
 - Spark igniters installed in the gas stoves in the cafeteria
 - A new hot water boiler in the gymnasium
 - New LED and compact fluorescent units for office desks and residences – 68 desk lamps replaced, 63 special LED floodlights replaced for Media Services, 205 replacement lamps for staff
 - New water saving shower heads installed
 - Heat pumps for four houses on campus
 - Solar hot water system for the residences

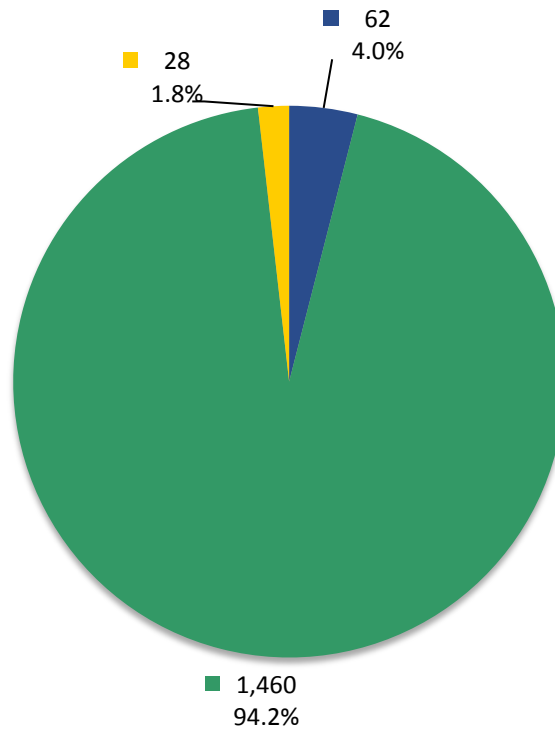
2. Opening of the new Learning and Innovation Centre, with the following Gold LEED features:
 - Energy performance optimized through an atrium, with “chimney effect” ventilation
 - High indoor air quality standards
 - Low emitting materials, and locally extracted/manufactured resources
 - 95% construction waste diverted from the landfill
 - High-efficiency lighting with auto sensors
 - 75% of the roof is highly reflective thereby reducing heat absorption, and addressing the potential heat island effect
 - Innovative water technologies – collection of non-potable water to be reused for toilets and irrigation, resulting in water savings estimated at 1.7 million litres per year, and potential for treating wastewater on site
 - Landscaping plan features native species and uses a water-efficient irrigation system
 - Alternative transportation options promoted by adjacency to public transportation and construction of bicycle parking and showers
 - Solar Hot Water system

- New recycling stations, with the sustainability brand, installed on every floor of the LIC, and outside the building
 - Three virtual education labs (sound production booths) contain interactive communications technologies and multimedia presentation capabilities to enable faculty to conduct teaching and research with students in a virtual environment
 - State-of-the-art large scale video conferencing, including two 60-inch LCD displays
 - “Centre for Dialogue” has a 30-foot wall screen and offers a wide range of podcasting tools, wikis, and wiki tutorials, as well as software for multimedia presentations and simultaneous language interpretation
 - Virtual meeting rooms linked to AV control centre
 - Wireless internet access throughout the building
3. Four full-size Energy Star refrigerators replaced older units, and one bar fridge.
 4. Two new Energy Star washers and dryers to replace older units.
 5. One new Energy Star dishwasher.
 6. Continued discussion on a District Energy System for campus with FortisBC, BC Hydro, League Assets, and Natural Resources Canada.
 7. The students passed a bylaw and a referendum leading to a successful vote to become part of the BC Transit U-Pass system. Bus ridership is up, and with the construction of a bus turnaround at the top of campus, bus service will be expanded. The university also accepted some recommendations from the student project on carpooling – having a week of free parking at the beginning of the academic term to enable students to sort out their travel arrangements and having multiple students on an annual parking pass, to support carpooling arrangements.
 8. The Solar Colwood Program was launched, with 80 installations of either solar hot water systems or ductless split heat pumps, or both. Two student reports were completed, as well as the first year of the Social Diffusion research project. The work being done by RRU on this program will represent the first ever documented energy savings from solar hot water systems – all other research in this area is based on surrogate data.
 9. Electric Vehicles are part of the Solar Colwood program, and there are plans for electric vehicle charging station infrastructure being built in Colwood. RRU is part of those plans.
 10. The baseline assessment for the Wetland Restoration Project was completed.
 11. Plans were completed for a new recycling station in the cafeteria, and funding was approved from the SAFE Fund (Sustainability Actions for the Environment) and the custodial staff’s Pop Bottle Fund for the construction of this new station, complete with the new sustainability branding.

PLANS TO CONTINUE REDUCING GREENHOUSE GAS EMISSIONS 2012-2014

1. The monitoring of the Solar Colwood program will continue, with results coming in on the actual energy savings from solar hot water systems. This will represent the first time that household level data has been collected.
2. New student projects will be underway related to Climate Change, Renewable Energy and Food Security.
3. An electric vehicle charging station will be in place on campus.
4. The feasibility of replacing more of the aging fleet vehicles with electric vehicles will help inform fleet vehicle replacements.
5. New recycling stations will be placed in more campus buildings, through funding from the SAFE fund and student legacy projects.
6. A feasibility study will be underway on the potential for renewable energy sources on campus, to meet our Board of Governors target of reducing GHG emissions by 50%.
7. A waste audit will be underway, with a study on the feasibility of an on campus composting system. The diversion rate on RRU is currently estimated at 70% and actions are needed to push this closer to 100%.
8. Continue to replace appliances with Energy Star appliances.
9. The potential of carbon sequestration in the wetland restoration area will be researched.
10. Results of the social diffusion research project will be released.
11. New funding streams will help increase the funds in the SAFE fund to enable more sustainability projects on campus, and off campus. The SAFE funds are divided into projects on campus and projects from alumni to use as start-up funds in their communities.
12. The bus turnaround will be completed at the top of campus, enabling additional buses to serve the RRU campus, and continue to increase ridership by RRU staff, faculty and students.
13. RRU will be re-assessed by the STARS rating system in 2014, with the plan to go from Silver to Gold. ISO 14000 will be researched by MEM students.
14. The Carbon and Energy Leadership Certificate will go online, which will increase enrolment in the program. Additional certificates will be reviewed specifically in the area of District Energy and Renewable Energy.

**Royal Roads University
Greenhouse Gas Emissions by Source
for the 2011 Calendar Year (tCO₂e*)**



Total Emissions: 1,550

- 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 2011 (Generated March 15, 2012 2:46 PM)

Total offsets required: **1,547**. Total offset investment: **\$38,675**. 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 2011

Measure	Quantity	Greenhouse Gases in Tonnes				
		CO ₂	CH ₄	N ₂ O	tCO ₂ e ¹	
Scope 1 (Direct) Emissions						
Mobile Combustion (Fleet)	Litres	28,584.82	56.58	0.01	0.01	60.65
Stationary Combustion, Reported ³	GigaJoules	28,552.43	1,327.78	0.03	0.02	1,335.74
Total Scope 1 Emissions			1,384.37	0.03	0.04	1,396.39
Scope 2 (Indirect) Emissions						
Purchased Energy, Estimated ²	GigaJoules	146.40	31.04	0.00	0.00	31.04
Purchased Energy, Reported ³	GigaJoules	13,393.50	92.42	0.00	0.00	92.42
Total Scope 2 Emissions			123.45	0.00	0.00	123.45
Scope 3 Emissions						
Business Travel and Office Paper						
Office Paper	Packages	4,631.00	27.51	0.00	0.00	27.51
Total Scope 3 Emissions			27.51	0.00	0.00	27.51
Emissions from Biomass						
Total Biomass Emissions			2.42	0.00	0.00	2.42
Total Emissions, Calendar Year 2011			1,537.75	0.03	0.04	1,549.77

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.

Royal Roads University - 2011 Carbon Neutral Action Report

Actions Towards Carbon Neutrality

The actions listed below contribute to a reduction in greenhouse gas emissions from sources for which public-sector organizations are responsible under the carbon neutral government regulation of the *Greenhouse Gas Reduction Targets Act*.

Action	Status (as of 12/31/11)	Performance to Date (as of 12/31/11)		Steps Taken in 2011	Steps Planned for 2012 -2014	Start Year	End Year
Mobile Fuel Combustion (Fleet and other mobile equipment)							
Vehicle fuel efficiency							
Replace vehicles with more fuel-efficient models	Ongoing/In Progress	61	% of vehicles are fuel- efficient models	Batteries continue to be replaced in Electric Golf Carts	Continue to replace older vehicles with fuel efficient models, as budget becomes available. Looking into electric vehicles, as part of the partnership with Solar Colwood and the installation of electric vehicle charging stations in the municipality, and hopefully one on campus.	2006	No End Date (Continuous)
Replace larger vehicles with smaller models according to fleet "right-sizing" principles	Ongoing/In Progress	60	% of vehicles down-sized since start year indicated	None	Continue to review vehicles according to capacity, needs and fuel efficiency.	2006	No End Date (Continuous)
Perform regular fleet maintenance specifically to improve fuel-efficiency	Ongoing/In Progress	100	% of vehicles are subject to regular maintenance for fuel efficiency	CMMS - computerized maintenance management system in place	Continue CMMS	2007	No End Date (Continuous)
Replace small maintenance vehicles with more fuel-efficient models	Ongoing/In Progress	60	% of small maintenance vehicles are fuel-efficient	None	Continue to replace older vehicles with fuel efficient models, as budget becomes available. Looking into electric vehicles, as part of the partnership with Solar Colwood and the installation of electric vehicle charging stations in the municipality, and hopefully one on campus.	2006	No End Date (Continuous)
Behaviour change program							
Provide fleet driver training to reduce fuel use	Ongoing/In Progress	100	% of current drivers are trained	Training carried out	Training will continue	2006	No End Date (Continuous)
Introduce anti-idling policy and/or raise anti-idling awareness for fleet drivers (e.g., signs, stickers, messages)	In Development				Place anti-idling stickers on dashes of all fleet vehicles.	2012	No End Date (Continuous)
Encourage carpooling in fleet vehicles	Ongoing/In Progress			Vehicles have been reduced and staff share vehicles regularly.	Continue vehicle sharing program.	2008	No End Date (Continuous)
Promote alternatives to fleet vehicle travel where possible (e.g., bicycles, public transit, walking)	Ongoing/In Progress			Staff walk between campus buildings. There are 18 electric golf carts for staff use.	Continue to encourage staff to walk between campus buildings and continue to purchase electric golf carts as budget becomes available.	2007	No End Date (Continuous)
Other Mobile Fuel Combustion Actions							
There is a Bachelor of Science student project underway in 2012 which is comparing electric vehicles to gas combustion vehicles, with a cradle-to-grave assessment and a return on investment analysis.	Ongoing/In Progress			Submitted the project proposal to the School of Environment and Sustainability.	The project was approved and will be completed in August, 2012.	2011	2012
Stationary Fuel Combustion, Electricity and Fugitive Emissions (Buildings)							
Planning/management							
Enrol in a building energy benchmarking program (e.g., GREEN UP)	Ongoing/In Progress			RRU is a Power Smart Partner	Continue to maintain credits to be a Power Smart Partner.	2007	No End Date (Continuous)

Royal Roads University - 2011 Carbon Neutral Action Report

Action	Status (as of 12/31/11)	Performance to Date (as of 12/31/11)		Steps Taken in 2011	Steps Planned for 2012 -2014	Start Year	End Year
Reduce office space (square meters) per employee	Ongoing/In Progress	112	is the current average rentable square meters per employee	RRU is undertaking a comprehensive corporate space plan to look at available space for growth projections. The space per employee includes classroom space - the university does not currently have separate figures for office space and classroom space.	Continue the corporate space plan and reallocate space to meet growth projections, keeping new construction requirements to a minimum.	2009	No End Date (Continuous)
Install a real time metering system (e.g. Pulse, Reliable Controls, Houle Controls)	In Development	0	% of buildings have a real time metering system installed	RRU continued to express the need for an Energy Manager.	A part-time Energy Manager has been appointed, and will undertake an analysis to determine the feasibility of installing a real-time metering system.	2010	No End Date (Continuous)
Owned buildings							
Establish energy performance baseline for owned buildings	In Development	0	% of owned buildings have an established energy performance baseline	RRU continued to express the need for an Energy Manager.	A part time Energy Manager has been appointed, and will work on establishing an energy performance baseline for RRU buildings.	2010	No End Date (Continuous)
Register for performance labelling/certification for operations and maintenance of owned buildings (e.g., LEED EB:O&M)	Ongoing/In Progress	4	% of owned buildings have operations and maintenance labelling/certification	The Learning and Innovation Centre was constructed as a LEED Gold building.	Any new buildings constructed will be registered.	2009	No End Date (Continuous)
Register for performance labelling/certification for commercial interiors of owned buildings (e.g., LEED CI)	Ongoing/In Progress	4	% of commercial interiors in owned buildings have labelling	The Learning and Innovation Centre was constructed as a LEED Gold building.	Any new buildings constructed will be registered.	2009	No End Date (Continuous)
Achieve LEED NC Gold certification at a minimum for new construction or major renovations	Ongoing/In Progress	0	% of owned buildings are certified LEED NC Gold or LEED NC Platinum	The process for certification has been initiated, with the workshop step completed.	Continue certification process.	2011	2012
Incorporate integrated design process into new construction or during renovations of owned buildings	Ongoing/In Progress	4	% of buildings built or renovated since start year indicated used the integrated design process	This process was used for the construction of the Learning and Innovation Centre.	Any new buildings constructed will use this process.	2009	No End Date (Continuous)
Incorporate a refrigerant management strategy into regular building management/maintenance to reduce fugitive emissions	Ongoing/In Progress			Qualified contractor hired to "retire" fugitive emissions when refrigerators are replaced.	Continue to hire a qualified contractor to "retire" fugitive emissions, where required.	2005	No End Date (Continuous)
Perform energy retrofits on existing, owned buildings	Ongoing/In Progress	92	% of owned buildings have undergone energy retrofits since start year indicated	A comprehensive retrofit program was completed, with funding from the Public Sector Energy Conservation Agreement. Projects included lighting (LED), heat pumps, new boiler, steam system upgrades, DDC recommissioning, low flow shower head replacements, insulation, air sealing, solar hot water systems, ventilation, DDC controls, and electronic gas range igniters.	Continue to retrofit buildings, as budget becomes available. The existing boathouse on campus is being renovated into an Aboriginal Learning and Cultural Centre, and this upgrade will include insulation, heating, low flow plumbing, low VOC paint, and natural wood finishes.	2010	No End Date (Continuous)
Retrofitting owned buildings							
Upgrade mechanical systems (heating, cooling, ventilation) during retrofits	Ongoing/In Progress	22	% of retrofits since start year indicated had heating, cooling, and ventilation systems upgrades	Heat pumps in student residences, domestic hot water systems in Grant Building, solar hot water system in student residence building, demand ventilation controls in library, heat recovery unit in library, energy efficient boiler in the castle, low flow shower heads in student residences.	As budget becomes available, continue to retrofit buildings.	2009	No End Date (Continuous)
Upgrade lighting systems during retrofits	Ongoing/In Progress	100	% of retrofits since start year indicated had lighting systems upgrades	Ballast replacement in all buildings for new fluorescents, LED bulbs, 205 LED desk lamps, 68 desk lamp replacement bulbs, 63 specialty LED flood lights for Media Tech.	As budget becomes available, continue to retrofit buildings.	2009	No End Date (Continuous)

Royal Roads University - 2011 Carbon Neutral Action Report

Action	Status (as of 12/31/11)	Performance to Date (as of 12/31/11)		Steps Taken in 2011	Steps Planned for 2012 -2014	Start Year	End Year
Upgrade/adjust control systems during retrofits	Ongoing/In Progress	43	% of retrofits since start year indicated had control system upgrades or adjustments	DDC Recommissioning, Expand DDC Control in Castle, DDC and outdoor reset for MEWS, OA reset House 10, DHW Temp reduction in Library and House 14, DDC's in Millward, Nixon, Pool, Library and Building 7b, Timer in Pool, Turn off lag boiler in library, Remove Hall EBB in Rose Garden Cottage and Reduce demand penalty in Building 7b.	As budget becomes available, continue to retrofit buildings.	2010	No End Date (Continuous)
Improve building insulation (including windows) during retrofits	Ongoing/In Progress	30	% of retrofits since start year indicated had insulation improvements	Insulation in Hatley Castle, Cedar, Nixon, Pool, Library, Gym and House 5, Air Sealing in Castle, Mews, Cedar, House 3,5,10,14,16, Millward, Gatehouse, Gym, Nixon, Grant, Library and Building 7b and mechanical insulation in various buildings. New windows in Boathouse.	As budget becomes available, continue to retrofit buildings.	2009	No End Date (Continuous)
Install an on-site renewable energy demonstration project	In Development	0	% of retrofits since start year indicated had on-site renewable energy components		There is potential for a mobile vertical wind turbine to be placed on campus for student research.	2012	2013
IT power management							
Install power management software which shuts down computers outside of regular business hours	Ongoing/In Progress	100	% of computers shut down automatically outside of regular business hours	Continued to refresh computers. The technology improves each year with respect to energy efficiency.	Continue to refresh computers.	2004	No End Date (Continuous)
Implement server virtualization	Ongoing/In Progress	100	% of servers have been virtualized since start year indicated	Continued existing program.	Continue existing program.	2004	No End Date (Continuous)
Apply auto-sleep settings on computer monitors and CPUs	Ongoing/In Progress	100	% of computers have auto-sleep settings applied	Continued existing program.	Continue existing program.	2004	No End Date (Continuous)
Remove stand-alone printers, copiers, and/or fax machines and install multi-function devices	Ongoing/In Progress			Image devices are chosen based on the needs of the department, and where possible, multi function devices are provided. As well, as department needs change, image devices are moved to other departments.	Continue existing program.	2004	No End Date (Continuous)
Apply auto-sleep settings on printers, copiers, fax machines, and/or multi-function devices	Ongoing/In Progress	100	% of devices have auto-sleep settings applied	RRU doesn't own the fax machines. There are auto-sleep settings on RRU owned image devices.	Continue existing program.	2004	No End Date (Continuous)
Replace computers with ENERGY STAR models during regular computer upgrades	Ongoing/In Progress	100	% of computers are ENERGY STAR rated	Continued existing program.	Continue existing program.	2004	No End Date (Continuous)
Appliances and electronic devices							
Replace refrigerators with ENERGY STAR models or source ENERGY STAR models for future purchases	Ongoing/In Progress	60	% of fridges are ENERGY STAR rated	4 full size fridges and 2 bar fridges replaced with Energy Star appliances.	Continue to replace with Energy Star models.	2008	No End Date (Continuous)
Replace other appliances or electronic devices with ENERGY STAR models or source ENERGY STAR models for future purchases	Ongoing/In Progress			2 washing machines, 2 dryers and 1 dishwasher replaced with Energy Star appliances.	Continue to replace with Energy Star models.	2008	No End Date (Continuous)
Replace desk lamp incandescent bulbs with compact fluorescent (CFL) bulbs or source more efficient desk lamps for future purchases	Ongoing/In Progress			68 desk replacement LED bulbs, 63 special LED floodlights, and 205 desk replacement lamps c/w LED bulbs.	Continue to replace with LED bulbs.	2008	No End Date (Continuous)
Behaviour change program							

Royal Roads University - 2011 Carbon Neutral Action Report

Action	Status (as of 12/31/11)	Performance to Date (as of 12/31/11)		Steps Taken in 2011	Steps Planned for 2012 -2014	Start Year	End Year
Help staff reduce personal energy use through "workstation tune-ups"	In Development	0	% of current staff have completed a workstation tune-up	None	Being planned for implementation in 2013.	2012	No End Date (Continuous)
Ask staff to unplug electrical equipment or switch off power bars when not in use	Ongoing/In Progress			Staff provided with power bars	Continue to supply power bars and encourage conservation practices.	2010	No End Date (Continuous)
Ask staff to close blinds at end of work day to reduce heating/cooling demands	Ongoing/In Progress			New Sustainability Brand completed.	Energy conservation program being planned, using the new Sustainability Brand.	2010	No End Date (Continuous)
Encourage staff to use air dry setting on dishwashers	Ongoing/In Progress			New Sustainability Brand completed.	Energy conservation program being planned, using the new Sustainability Brand.	2010	No End Date (Continuous)
Provide tips to staff on saving energy in the office while working outside of regular business hours	Ongoing/In Progress			New Sustainability Brand completed.	Energy conservation program being planned, using the new Sustainability Brand.	2010	No End Date (Continuous)
Encourage use of stairs instead of elevators	In Development			The new Learning and Innovation Centre has user friendly stairwells.	Work with RRU recreation centre staff to start up a program of using the stairs instead of the elevators.	2011	No End Date (Continuous)
Provide reminders for turning off lights (e.g., signs, stickers, messages)	Ongoing/In Progress			New Sustainability Brand completed.	Energy conservation program being planned, using the new Sustainability Brand.	2010	No End Date (Continuous)
Promote hot water conservation	Ongoing/In Progress			New Sustainability Brand completed.	Energy conservation program being planned, using the new Sustainability Brand.	2010	No End Date (Continuous)
Other Stationary Fuel Combustion, Electricity, and Fugitive Emissions Actions							
Attended an Energy Star Workshop, hosted by Natural Resources Canada and distributed very useful information on Energy Star appliances to the key staff responsible for purchasing.	Ongoing/In Progress			Attended Power Smart Forum, District Energy Workshop.	Continue to attend Power Smart Forum and District Energy Workshops, as well as other energy related educational sessions.	2009	No End Date (Continuous)
Supplies (Paper)							
Paper Type							
Purchase 30% post-consumer recycled paper	Ongoing/In Progress	95	% of total paper purchased contains 30% recycled content	None	None	2005	No End Date (Continuous)
Purchase 100% post-consumer recycled paper	In Development	5	% of total paper purchased contains 100% recycled content	None	None	2005	No End Date (Continuous)
Printer/document settings							
Switch networked printers and photocopiers to automatic double-sided	Ongoing/In Progress	100	% of network printers or photocopiers are set to automatic double-sided	None	None	2005	No End Date (Continuous)
Reduce default margin size in standard document templates (e.g., letters, briefing notes, forms, etc.)	In Development			None	None	2012	No End Date (Continuous)
Electronic media in place of paper							

Royal Roads University - 2011 Carbon Neutral Action Report

Action	Status (as of 12/31/11)	Performance to Date (as of 12/31/11)		Steps Taken in 2011	Steps Planned for 2012 -2014	Start Year	End Year
Install collaborative software for electronic editing (e.g. SharePoint, Groove, etc.)	Ongoing/In Progress	100	% of staff workstations with software installed	Staff are trained on Elluminate and also have access to SharePoint	Continue to make Elluminate and SharePoint available to all staff and faculty. Multiple training opportunities will continue to be offered to staff and faculty.	2007	No End Date (Continuous)
Use electronic document library for filing common documents	In Development			Document library established for large documents.	None	2008	No End Date (Continuous)
Post materials online that were previously printed	Ongoing/In Progress			Document library established for large documents.	None	2008	No End Date (Continuous)
Switch to an electronic payroll notification system in place of paper pay stubs	In Development			None	None	2001	No End Date (Continuous)
Behaviour change program							
Train staff to use collaborative software for electronic editing (e.g. SharePoint, Groove, etc.)	In Development	0	% of staff currently have received collaborative software training	Training plan completed.	Implement the plan.	2011	No End Date (Continuous)
Encourage staff to hold paperless meetings or presentations (i.e., no handouts)	In Development			University has a focus on online learning and we encourage the use of laptops at meetings and presentations.	The use of tablets and smart devices is increasing and creating a servicing/network issue which will require improvement.	2011	No End Date (Continuous)
Encourage re-use of scrap paper	In Development			None	This will be part of the energy conservation program.	2012	No End Date (Continuous)
Other Paper Supplies Actions							
The students all do major work projects, and during the budget discussions on "printing reports" for the client, they are told to only produce one paper copy and the remainder in electronic form.	In Development				Student reports for major projects will continue to be provided electronically to clients.	2010	No End Date (Continuous)

Royal Roads University - 2011 Carbon Neutral Action Report

Actions to Reduce Provincial Emissions and Improve Sustainability

The actions listed below contribute to a reduction in greenhouse gas emissions from sources that fall outside of the reporting requirements defined in the carbon neutral government regulation of the *Greenhouse Gas Reduction Targets Act*. Public sector organizations can optionally use this section to report on actions that will help British Columbia meet its provincial greenhouse gas reduction targets, engage the public, and improve environmental sustainability across all aspects of their organization.

Action	Status (as of 12/31/11)	Performance to Date (as of 12/31/11)		Steps Taken in 2011	Steps Planned for 2012 -2014	Start Year	End Year
Business Travel							
Policy and budgeting							
Create a low-carbon travel policy or travel reduction goal	In Development			Continued to work with BC Government representatives to become a pilot university for Smarttec.	Continue to work on becoming a pilot for Smarttec.	2010	No End Date (Continuous)
Virtual meeting technology							
Install web-conferencing software (e.g., Live Meeting, Elluminate, etc.)	In Development	100	% of computers have web-conferencing software installed	Staff are trained on Elluminate.	Continue to train staff on Elluminate.	2007	No End Date (Continuous)
Make desktop web-cameras available to staff	Ongoing/In Progress	25	% of staff have access to a desktop web-camera	New all-in-one screens all have web cameras.	Continue to replace existing screens with all in one screens.	2011	No End Date (Continuous)
Install video-conferencing units in meeting rooms or provide mobile video-conferencing units	Ongoing/In Progress	10	% of meeting rooms have access to video-conferencing equipment	The new Learning and Innovation Centre includes two new video conferencing rooms, in addition to the existing ones on campus.	Continue to include video conferencing technology in any new classroom buildings.	2009	No End Date (Continuous)
Behaviour change program							
Train staff in web-conferencing	Ongoing/In Progress	25	% of staff are trained web-conferencing	Most of the RRU students are online students and staff and faculty need to be trained in web-conferencing.	Continue to train staff on web-conferencing.	2007	No End Date (Continuous)
Train staff in video-conferencing or provide technical support for video-conferencing set-up	In Development	5	% of staff are trained in video-conferencing or have access to technical support	Two technical staff are trained and available for support for the new video conferencing facilities in the LIC.	Continue to provide support for video conferencing and increase the number of staff trained in this area.	2011	No End Date (Continuous)
Encourage staff to consider virtual attendance/presentation at events where possible	Ongoing/In Progress			The use of Live Meeting, video conferencing has increased because of the new facilities in the LIC. A Centre for Dialogue was built into the new building to encourage large-scale video conferencing, with two 60-inch LCD displays. Sessions held in the Centre for Dialogue are also live streamed to the broader audience.	Continue to encourage the use of the Centre for Dialogue by staff, faculty, guests, students and the community.	2011	No End Date (Continuous)
Encourage carpooling to meetings	Ongoing/In Progress			Bachelor of Commerce students worked on a new carpool policy for RRU.	Review and revise the existing carpool policy.	2011	No End Date (Continuous)
Encourage alternative travel to meetings (e.g., bicycles, public transit, walking)	Ongoing/In Progress			Staff and faculty walk to meetings on campus, or use the 18 electric golf carts which are available. As well, a cycling survey was undertaken with staff and faculty and a bike plan was started.	Complete the bike plan and implement the recommendations. Continue to encourage staff and faculty to use alternative transportation to meetings.	2007	No End Date (Continuous)
Other Business Travel Actions							

Royal Roads University - 2011 Carbon Neutral Action Report

Action	Status (as of 12/31/11)	Performance to Date (as of 12/31/11)	Steps Taken in 2011	Steps Planned for 2012 -2014	Start Year	End Year
Although not a "staff" action, the students at RRU passed a bylaw and a referendum to become eligible for the Upass. Work is now needed to increase the number of staff and faculty using the BC Transit Propass.	Ongoing/In Progress		The RRUSA (student Council) passed a bylaw and referendum to be eligible for the BC Transit Upass system.	The Upass only applies to the on campus students, and a custom program is required for the on line students when they come to campus for their residencies. A promotion program is required to encourage more staff to use the transit system, and other alternatives to single occupant vehicles. The work ahead is to increase bus service to RRU, and the construction of the bus turnaround at the top of campus will be a major first step in achieving this goal.	2009	No End Date (Continuous)
Education, Awareness, and Engagement						
Team-building						
Create Green, Sustainability, Energy Conservation, or Climate Action Teams with executive endorsement	Ongoing/In Progress		The RRUSA (student council) established a Sustainability Committee as part of their committee structure. RRU also has a Bike to Work Committee and a Bottled Water Free Committee, all supported by the Office of Sustainability.	Continue to support sustainability initiatives on campus, and in the community.	2009	No End Date (Continuous)
Provide resources and/or dedicated staff to support teams	Ongoing/In Progress		Office of Sustainability supports the student, faculty and staff and the community. One of the major "event" days is Earth Day each year, both on campus and in the community.	Continue to support sustainability initiatives on campus, and in the community.	2009	No End Date (Continuous)
Providing behaviour change education/training to teams (e.g., community-based social marketing)	Ongoing/In Progress		The Office of Sustainability provides resources, such as community based social marketing advice, to academic classes and to the community.	Continue to support sustainability initiatives on campus, and in the community.	2010	No End Date (Continuous)
Awards/Recognition						
Establish a sustainability/green awards or recognition program	Ongoing/In Progress		RRU was the host university for the Go Beyond Coordinator and in 2011, the project was a contest among students from UVIC, Camosun College and RRU, and the student group from RRU won! Their winning project was a carbon emissions program for the Town of Sidney, and their prize was a \$500.00 tuition credit for each of their team members (three members).	Continue to support Go Beyond and the Ready, Set, Solve contest.	2011	No End Date (Continuous)
Staff Professional Development						
Support green professional development (e.g., workshops, conferences, training)	Ongoing/In Progress		Highlights for 2011 include the UBC Sustainability Conference, the BC Hydro Power Smart Forum, the District Energy Association meeting and the Vancouver Island University Sustainability Think Tank session.	Continue to provide professional development opportunities.	2009	No End Date (Continuous)
Staff awareness/education						
Provide education to staff about the science of climate change	Ongoing/In Progress		RRU launched its new Sustainability Website, at www.sustainability.royalroads.ca which provides a one-stop shop for sustainability information, research, reports and news. RoadSpiel is the RRU newsletter and links staff to weekly research and information on Climate Change, provided by the faculty, staff and Office of Sustainability.	Keep providing staff and faculty with current information and research results through RoadSpiel and the new Sustainability Website. In addition, the Office of Sustainability will have input into the new student orientation program.	2009	No End Date (Continuous)
Provide education to staff about the conservation of water, energy, and raw materials	Ongoing/In Progress		As above. In addition, two new certificate programs were launched - Carbon and Energy Leadership and Sustainable Community Development.	Expand opportunities for certificates. One being proposed is on District Energy systems.	2009	No End Date (Continuous)

Royal Roads University - 2011 Carbon Neutral Action Report

Action	Status (as of 12/31/11)	Performance to Date (as of 12/31/11)	Steps Taken in 2011	Steps Planned for 2012 -2014	Start Year	End Year
Provide green tips on staff website or in newsletters	Ongoing/In Progress		Green Tips are regularly included in Roadspiel. The BSC students also created a Green Guide as their major project in 2011 and it is available on the Sustainability Website and in the Student's orientation program.	Continue to provide Green Tips and update the Green Guide.	2009	No End Date (Continuous)
Provide sustainability education during new staff orientation	Ongoing/In Progress		The new Green Guide is now available, as well as the Sustainability Website. New staff also receive a tour of Royal Roads, with a verbal affirmation of the University's commitment to sustainability, and the Hatley Park National Historic Site.	Continue to provide the Green Guide and include sustainability in the student and staff orientation programs.	2009	No End Date (Continuous)
Client/public awareness/education						
Provide education to clients/public about the science of climate change	Ongoing/In Progress		RRU won an award with the City of Colwood for its partnership on the Solar Colwood program. Much of this role includes providing education to clients and the public on climate change.	Continue to participate in the Solar Colwood program, the Westshore Earth Day events, and the Esquimalt Stewardship Lagoon Initiative and provide education on climate change.	2009	No End Date (Continuous)
Provide education to clients/public about the conservation of water, energy, and raw materials	Ongoing/In Progress		The new Sustainability Website was created to be open to the public for this purpose.	Continue to update the Sustainability Website as an educational resource for the public.	2009	No End Date (Continuous)
Provide green tips on client/public website or in newsletters	Ongoing/In Progress		The new Sustainability Website was created to be open to the public for this purpose.	Continue to update the Sustainability Website as an educational resource for the public.	2009	No End Date (Continuous)
Other Education, Awareness, and Engagement Actions						
The Office of Sustainability and CUPE will be hosting the March 15th Bottle Water Free Day event on campus.	In Development			March 15th, 2012 Bottle Water Free Day will be celebrated on campus with an information table in the Habitat cafeteria.	2012	No End Date (Continuous)
The Community Relations and Advancement Department has supported the Office of Sustainability in a number of media related events, and print coverage, including the In Roads articles, the Green Scene publication and most recently, the Globe and Mail section on Green Technology.	Ongoing/In Progress		Excellent news coverage in 2011 on the RRU sustainability initiatives and in particular the new RRU Learning and Innovation Centre and the many environmental features of the new building.	Continue to work with the Department of Community Relations and Advancement on green publications and green news events to help further RRU's objectives.	2011	No End Date (Continuous)
Other Sustainability Actions						
Water conservation						
Establish a water conservation strategy which includes a plan or policy for replacing water fixtures with efficient models	Ongoing/In Progress		Energy retrofit included replacement of shower heads. The new LIC uses all new water efficient plumbing fixtures.	Continue to replace fixtures with efficient models. When the existing dorm rooms are renovated, new water efficient plumbing fixtures will be used.	2011	No End Date (Continuous)
Put in place a potable water management strategy to reduce potable water demand of building-level uses such as cooling tower equipment, toilet fixtures, etc. and landscape features	Ongoing/In Progress		Non-potable water currently used in irrigation system. The new LIC uses non-potable water for all of the toilets and irrigation, resulting in a savings of 1.7M litres of water per year, and has the potential for treating wastewater on site. The landscaping also included mostly native plant species.	Continue to use non-potable water. Ensure the next new building has filters on the system to prevent breakdowns due to the needle fall from the surrounding fir trees.	2005	No End Date (Continuous)
Introduce a stormwater management landscape strategy (e.g., vegetated roofs, permeable paving, rain gardens, bioswales)	Ongoing/In Progress		Stormwater system in place.	Continue the stormwater system.	2010	No End Date (Continuous)
Waste reduction/diversion						
Put in place an operations policy to facilitate the reduction and diversion of building occupant waste from landfills or incineration facilities	Ongoing/In Progress		Comprehensive recycling program in place. As well, all grounds materials are composted and used on the gardens. The new LIC included a new recycling program, complete with a new sustainability brand.	There is a need to create a new education program on recycling, both for the new recycling program in the LIC and for the increasing numbers of students coming to campus.	2005	No End Date (Continuous)

Royal Roads University - 2011 Carbon Neutral Action Report

Action	Status (as of 12/31/11)	Performance to Date (as of 12/31/11)		Steps Taken in 2011	Steps Planned for 2012 -2014	Start Year	End Year
Procurement (non-paper supplies)							
Incorporate minimum recycled content standards into procurement policy for consumable, non-paper supplies (e.g., writing instruments, binders, toner cartridges, etc.)	Ongoing/In Progress			RRU is part of a cooperative purchasing network, which purchases green products.	Continue to be part of the cooperative purchasing network.	2009	No End Date (Continuous)
Establish green standards for goods that are replaced infrequently and/or may require capital funds to purchase (e.g., office furniture, carpeting, etc.)	Ongoing/In Progress			LEEDS gold standards were used in the new LIC. All existing furnishings are recycled.	Continue	2001	No End Date (Continuous)
Implement sustainable purchasing program for cleaning products, disposable paper products and trash bags	Ongoing/In Progress			A new Green Cleaning Guide was produced for RRU. The University has a non-toxic cleaning program.	Continue	2005	No End Date (Continuous)
Require a minimum purchase of sustainable, and organic food and beverages supplied by contracted food suppliers or caterers	Ongoing/In Progress	10	% of the combined total food and beverage purchase (in cost) meets these requirements	The Habitat Café is Green Table certified, Ocean Wise certified, and uses all compostable serving utensils and containers. The café composts all of the food waste and is almost 100% waste free.	The Masters of Environmental Management are doing a Food Security Project, looking at increasing the amount of local food being supplied on campus, and the potential for a herb garden for the Habitat Café.	2009	No End Date (Continuous)
Building construction, renovation, and leasing							
Establish a policy to reuse materials where possible and divert construction and demolition debris from landfills and incineration facilities	Ongoing/In Progress			95% of the construction waste from the building of the LIC was diverted from the landfill.	Continue to reuse materials, compost materials and improve the waste diversion rate on campus. The rate is currently approximately 75%, which is the highest among similar facilities.	2005	No End Date (Continuous)
Incorporate lifecycle costing into new construction or renovations	Ongoing/In Progress	100	% of business cases incorporating lifecycle costing since start year indicated	The percentage applies to lifecycle costing of new construction projects only. The LEEDS NC Gold standard required lifecycle costing for the new LIC building.	Determine if the process is suitable for other construction projects on campus.	2011	No End Date (Continuous)
Indoor air quality							
Enforce a scent-free policy (e.g., no strong perfumes, deodorants, etc.)	Ongoing/In Progress			Human Resources has produced a scent-free pamphlet and has held information sessions to encourage the work place to be scent-free.	Continue, with new emphasis needed with the increasing student population.	2010	No End Date (Continuous)
Incorporate low volatile organic compounds (VOCs) standards into procurement policy for products such as paints, carpets, and furniture	Ongoing/In Progress			All paints are low VOC's.	Still need to expand this to carpets and furniture.	2005	No End Date (Continuous)
Commuting to and from home							
Encourage commuting by foot, bicycle, carpool or public transit	Ongoing/In Progress			The RRU students passed a bylaw and referendum to approve joining the Upass program of BC Transit. Ridership has increased and we are hoping for an equal improvement in bus service. A bus turnaround plan was completed for the top of campus.	Implement the bus turnaround plan and continue to encourage staff to use alternative transportation.	2011	No End Date (Continuous)
Provide shower or locker facilities for staff/students who commute by foot or by bicycle	Ongoing/In Progress			Showers and lockers were provided in the new LIC.	Continue to include showers and lockers in any new buildings on campus, and during renovations to existing buildings.	2011	No End Date (Continuous)
Provide secure bicycle storage	Ongoing/In Progress			New covered bike racks provided as a result of the new LIC.	Continue to provide covered bike storage. A cycling plan will be completed and implemented. A bike "end of line service" station will be built, subject to budget availability.	2011	No End Date (Continuous)
Modify parking fees or parking availability for staff/students	In Development				Bachelor of Commerce student projects will continue to look at the impact of parking fees on commuting choices.	2009	No End Date (Continuous)
Other Sustainability Actions							

Royal Roads University - 2011 Carbon Neutral Action Report

Action	Status (as of 12/31/11)	Performance to Date (as of 12/31/11)	Steps Taken in 2011	Steps Planned for 2012 -2014	Start Year	End Year
RRU continues to be a member of QUEST - Quality Urban Energy Systems of Tomorrow, and through this network, is working on a new academic certificate in the area of District Energy, and the potential of a District Energy system for campus.	Ongoing/In Progress		RRU continued to be represented on QUEST through the Office of Sustainability. This membership enabled representation of RRU at the Canadian Federation of Municipalities meeting in Victoria, and the Union of BC Municipalities meeting in Vancouver.	Continue to have representation on QUEST and continue to support integrated energy systems through RRU campus initiatives and academic programming.	2010	No End Date (Continuous)