

## Carbon Neutral Action Report Kwantlen Polytechnic University

### Executive Summary

We have taken many steps to reduce energy consumption which also reduce greenhouse gas emissions and help achieve carbon neutrality. In 1995 we were one of the first post secondary institutions to join the federal government's Energy Innovators Initiative and Canada's Climate Change Voluntary Challenge and Registry (VCR).

Kwantlen assisted the Government of British Columbia to develop its Green Buildings BC - Retrofit Program by becoming the first "Pilot Project" to test the various policies and instruments that underpin its efforts. The retrofit program was completed in 2002 using an energy services agreement with Vestar.

Our efforts as leaders in energy conservation have been acknowledged with receipt of several awards. In 2003, we received the Leadership Award under the Colleges and Universities sector (for 2002) for outstanding environmental efforts and for being the top Canadian post-secondary Institution in "going green." CSA GHGR Inc. president Robert Flemington explained that organizations are chosen for the Leadership Award for showing a significant decrease in the intensity of GHG emissions, demonstrating senior management commitment, setting future reduction targets and preparing detailed action plans and progress reports.

Kwantlen was one of only nine BC organizations (2 post-secondary's) honoured by B.C. Hydro with a "Certified Energy Efficiency Leader" award. In 2008 a new top award, Excellence in Energy Management was presented by BC Hydro with Kwantlen the only post-secondary institution even nominated for this award.

All new construction has incorporated sustainable practices and four of our Facilities personnel are LEED certified professionals. The Cloverdale campus was completed in 2007 achieving a LEED Gold designation. In 2007/08 Kwantlen completed construction of additions to Buildings A and C which are LEED buildings targeting LEED Gold or better. Construction began in 2008 on a research facility to support research to assist the Horticulture industry to be more sustainable. The facility is targeting LEED Gold and includes a greenhouse that will use geothermal energy to provide heating.

### Objectives

Ongoing projects are performed to reduce energy consumption and greenhouse gas emissions. In 2007 we committed to reduce energy density per square meter by 45% for electricity and 25% for natural gas from 2000 levels by 2010. For fiscal year 2008/09 we are 71% towards achieving our electricity reduction target and 129% towards achieving our natural gas target.

Since our original goals were established we have started to shift our heating technology from natural gas heating to electric Geoexchange heating. This shift is increasing our electrical consumption and reducing our natural gas consumption. Due to this shifting we have revised our energy savings unit of measurement to ekWh/M2 which is the combined electrical and natural gas unit of energy.

For reporting period 2008/09 we have made 95% progress achieving our goal based on the ekWh unit of energy.

## Part 1: Actions Taken to Reduce Greenhouse Gas Emissions in 2008

### Overview

All new construction is built to a minimum of LEED Gold equivalency.

In 2008, numerous energy conservation projects to reduce energy consumption and greenhouse gas emissions have been completed including a control systems upgrade at the Richmond campus, occupancy sensors for 24 washrooms, ongoing energy use awareness training of janitorial, security and facilities personnel and completion of an energy audit.

An audit was completed identifying energy consumption and expenditures from 1994 to present. Trends were identified and relevant factors for ongoing monitoring determined.

The Resource Management Action Plan was updated identifying further opportunities for energy conservation.

Funding request was submitted to PSECA.

Completed BC Hydro's 1 - 5 evaluation with a rating of our operations at the two star level.

Provided leadership in energy management by presenting to groups throughout North America on how to achieve excellence in energy management.

Provided tours of new energy efficient buildings to educate others as to features and benefits of these buildings and was interviewed for journal articles on LEED buildings.

Numerous educational offerings incorporate sustainability topics.

### 1.1 Mobile Fuel Combustion

Action	Action Taken	Outcome/Performance Measure	Notes Clarifying Action Taken
Replaced # of TYPE OF VEHICLE with MORE EFFICIENT VEHICLE/Hybrid.	Complete	Eliminated two vehicles, and replaced two vehicles with more fuel efficient models.	
Initiated new fleet maintenance program (could include – changing filters, checking tire pressure, regular check-ups)	Complete	Replacement vehicles have maintenance program developed and employees are comparing fuel efficiency between vehicles and drivers.	
Electric car recharging stations	Completed	Cloverdale campus has electric car recharging stations.	
Electric scooter recharging station	Completed	Langley campus has a recharging station for electric scooters.	

## 1.2 Stationary fuel combustion and electricity

Action	Action Taken	Outcome/Performance Measure	Notes Clarifying Action Taken
			Add control to ventilation dampers for morning warm-up; Start adding occupancy sensors to turn off washroom lighting when not occupied; Start converting Richmond Campus high variable use areas to demand ventilation control; Conducted energy audits to determine additional energy conservation opportunities.
Replaced a number of computers with EnergyStar models.	In Progress	Replaced 70 pc computers with thin-client computers that reduced energy consumption by 80%.	This is a pilot project that will expand into replacement of up to 1800 pc computers in 5 years.
Asked staff to close blinds daily.	In Progress		Security personnel assist for those that have overlooked closing blinds.
Turned off lights in unused rooms.	In Progress	Energy savings.	Larger rooms have motion sensors. Labels reminding users to turn off the lights are in place by all light switches. Security and Cleaning personnel assist to ensure lights have been turned off. The building management system automatically turns off all lights at a set time.
Replaced Refrigerators (EnergyStar rated appliance).	In Progress		Replacement and new fridges are EnergyStar rated.
Replaced other appliances (with EnergyStar rated appliance).			Replacements are EnergyStar rated.
Installed multi-function devices (and removed stand-alone printers/faxes).	In Progress	Energy savings.	An ongoing initiative for the past several years with majority of equipment being multi-function devices.
Replaced standard bulbs with CFL's.	Complete	Energy savings.	Performed as part of energy efficiency project in 2000/01. New desk lamps in Library are LED.
Installed motion activated lights.	In Progress	Energy savings.	Performed as part of energy efficiency project in 2000/01; continuing to add additional sensors as funds available.
Undertaken lighting retrofit.	In Progress	Energy savings.	Performed as part of energy efficiency project in 2001/02 retrofit completed; ongoing replacements continue based on availability of new technology.
Implemented server virtualization.	Complete	Reduction in energy consumption of the 64 servers by 85%.	Virtualized 14 existing and 50 new servers.
Initiated corporate computer shut-down/wake-up for maintenance.	Complete	Implemented on computers with 67% energy saving. BC Hydro calculated the energy saving as sufficient to power 42 homes per year.	
Unplugged unused equipment.	In Progress	Energy savings.	We encourage unplugging unused equipment.

Undertaken building energy audit at LOCATION(s).	Complete	Audited 3 main campus locations in 2008.	Langley - Richmond - Surrey Campus have been audited. Cloverdale was opened in 2007, is LEED Gold and has not been audited.
Initiated or completed a building energy retrofit .	Complete		Major retro fit in 2001/02.
Replaced portable heaters .	Complete	90% reduction in energy use for this item.	Portable space heaters replaced with radiant heater that consumes 1/10 the energy.
Replaced CRT monitors with LCD monitors.	In Progress	Replaced 150 monitors.	

### 1.3 Supplies

Action	Action Taken	Outcome/Performance Measure	Notes Clarifying Action Taken
Committed to use 30% recycled paper.	Complete	Have been using for 3 years.	
Committed to use 100% recycled paper.	Planned		
Initiated automatic double sided printing.	Complete	Reduce paper usage. Estimated savings equivalent to 82 trees.	Implemented on all multifunction print/copy devices.
Developed document library (online and one printed copy) for large documents.	In Progress	Reduce paper usage.	Internet team collaboration space for document sharing.
Re-used non-confidential scrap paper.	In Progress		In house Print Service creates notepads.
Used laptops/tablets .	In Progress	Reduce paper usage.	Expand roll out of laptops to staff and faculty.
Restructured a process to use less paper.	In Progress		Initiated online reporting for pay statements and for expense cheque payments.
<b>Actions on non-paper related supplies:</b>			
Chose "Green" items from Distribution Centre .	In Progress		Green products selected from Distribution Centre and evaluation and selection of green products as appropriate for our organization from other suppliers.
Encouraged re-use of furniture and equipment.	In Progress	Estimate close to \$1 million in value of furnishings have been reassigned in past 2 years.	Inventory surplus items and re-use as possible.
Green Cleaning processes implemented which use environmentally friendly products.	Complete	Healthier indoor environment and less impact on environment from cleaning chemical usage.	Environmentally friendly cleaning products used at each campus location.
Online course websites for sharing of course material.	In Progress	Reduction in distribution of printed material.	2000 course sections with online resources.
New building materials selected to reduce supplies required to maintain.	In Progress	Building materials are selected to minimize impact on the environment.	An example is the flooring product chosen requires no chemical processes for maintenance and utilizes micro fibre technology for maintenance to reduce water consumption.
Recycling of obsolete computer equipment.	In Progress	90% of obsolete computers are donated for reuse by charitable organizations. Remaining 10% are recycled through approved recycling depot.	

<b>1.4 Travel</b>			
<b>Action</b>	<b>Action Taken</b>	<b>Outcome/Performance Measure</b>	<b>Notes Clarifying Action Taken</b>
Installed Video Conferencing facilities.	In Progress	Reduced travel cost.	Video conferencing facilities installed in 3 locations as pilot project.
<b>1.5 Employee Engagement</b>			
<b>Action</b>	<b>Action Taken</b>	<b>Outcome/Performance Measure</b>	<b>Notes Clarifying Action Taken</b>
Provided climate change education.	In Progress	Increased awareness	Provided educational events for community including Green Wednesdays.
Provided green tips.	In Progress	Increased awareness	Provided green tips on website.
Supported professional development.	In Progress	Increased awareness	Numerous in-house educational sessions as well as attendance at conferences.
Membership in CaGBC and AASHE	In Progress	Sustainability information	AASHE membership provides information for all students and employees.
<b>1.6 Sustainability Actions (others)</b>			
<b>Action</b>	<b>Action Taken</b>	<b>Outcome/Performance Measure</b>	<b>Notes Clarifying Action Taken</b>
Took water conservation measures – low flow showers or toilets, fix leaks.	Complete		Added low flow devices to washroom taps in 2006. Audited all faucets in 2008, repairing leaks and installing low flow devices on faucets where missing.
Ran dishwasher only when full.	Planned		
Reduced/replaced bottled water with filtered or refrigerated water.	Planned		Decision pending.
Improved recycling measures.	Planned		Well established program, in place for more than 10 years, is being enhanced.
Used re-usable dishes.	In Progress		
Purchased green cleaning products.	In Progress		Green cleaning for past seven years.
Used green (low-e paints).	In Progress		
Supported sustainable procurement practices.	In Progress		Weekly review of integrating green opportunities
Adopted low-carbon contracting practices.	In Progress		Through LEED for major building construction.
Purchase green power certificates.	In Progress		50% of the power for our Cloverdale campus and 100% of the power for our Surrey campus Library is provided from green power.
LEED Professional training.	Complete	LEED AP	One Facilities department employee completed training as LEED professional.

## Part 2: Plans to Continue Reducing Greenhouse Gas Emissions 2009 -- 2011

### Overview

Building upon our commitment to continuous improvement in sustainable practices we will be expanding upon our current initiatives. Projects will be undertaken to reduce energy consumption within our buildings including replacement of the boilers at the Surrey and Langley campuses and lighting improvements at all campuses.

There will be an increased focus on creating and providing more awareness training.

Procurement practices will include more research into assessing new green products.

Food services practices will incorporate more sustainable practices.

### 2.1 Mobile Fuel Combustion

Action	Action Planned	Outcome/Performance Measure	Notes Clarifying Action Taken	Timeframe
Provide driver training to reduce fuel use.	Planned			
Initiate new fleet maintenance program (could include – changing filters, checking tire pressure, regular check-ups).	In Progress		Review will be completed to ensure program in place is maintained.	2009

### 2.2 Stationary Fuel Combustion (including electricity)

Action	Action Planned	Outcome/Performance Measure	Notes Clarifying Action Taken	Timeframe
Replace # computers with EnergyStar models.	In Progress	Replacing 340 student computers with thin-clients. 220 staff computers to be replaced with more energy efficient models.	Expand thin-client implementation. Replace old computers with energy efficient models.	2009
Ask staff to close blinds daily .	In Progress		Security personnel turn off lights if overlooked by employees. Website energy saving tips includes this suggestion.	
Use air dry setting on dishwashers.	In Progress			
Encourage staff to use stairs.	In Progress	Signage		2009
Turn off lights in unused rooms.	In Progress	Signage, reminders to personnel	Security personnel close blinds if overlooked by employees. Website energy saving tips includes this suggestion.	
Replace Refrigerators (EnergyStar rated appliance).	In Progress		Replacements are Energy Star.	
Replace other appliances (with EnergyStar rated appliance).	In Progress		Replacements are Energy Star.	
Install multi-function devices (and remove stand-alone printers/faxes).	In Progress		Majority of equipment are multi-function devices.	
Replace standard bulbs with CFL's.	Complete			
Install motion activated lights.	In Progress		Additional washrooms/classrooms.	2009
Undertake lighting retrofit.	In Progress	Anticipated to save 40,000 kW/yr which is estimated GHG reduction of 1 tones eCO2/yr.	Lower wattage tubes in hallways.	

Implement server virtualization.	In Progress	Estimate 90% reduction of energy consumption by the 50 servers.	Virtualized 50 existing servers.	
Utilize desk-top power management settings on computer.	In Progress			
Initiate corporate computer shut-down/wake-up for maintenance.	Complete			
Unplug unused equipment.	In Progress			
Apply for LEED existing building rating.				
Undertake building energy audit at LOCATION(s).	In Progress			
Initiate or complete a building energy retrofit .	In Progress			
Replace Boiler (Surrey Campus).	In Progress	Anticipate reduction in natural gas consumption at Surrey Campus by estimated 4000 GJ which is GHG reduction of 206 tones eCO2/yr.	Replace 1 boiler at Surrey Campus with high efficiency unit. This work is in design phase.	
Expand geothermal field.	In Progress			
Retrofit original Library mechanical system.	In Progress	Estimate 60% reduction in energy consumption.		
Undertake energy audit of data centre at Surrey campus.	Planned	Reduce energy consumption.	Provide baseline for energy efficiency improvements.	
Replace CRT monitors with LCD monitors.	In Progress	Reduce in energy consumption.		
<b>2.3 Supplies</b>				
<b>Action</b>	<b>Action Planned</b>	<b>Outcome/Performance Measure</b>	<b>Notes Clarifying Action Taken</b>	<b>Timeframe</b>
Commit to use 30% recycled paper.	In Progress			
Commit to use 100% recycled paper.	Planned			2009
Initiate automatic double sided printing.	In Progress	All printing devices on campus are defaulted to double-sided. More than double current savings.	Expand to include all network printers.	
Develop document library (online and one printed copy) for large documents.	In Progress	Reduce print pages.	Implement online document library on the intranet sharing of documents within and across departments.	
Re-use non-confidential scrap paper.	In Progress		Continue practice of re-use.	
Use laptops/tablets .	In Progress			
Restructure a process to use less paper.	In Progress		Electronic purchase requisitions.	2009
Choose "Green" items from Distribution Centre .	In Progress			
Encourage re-use of furniture and equipment.	In Progress		Continue to maintain inventory of items and re-assign.	
Implement print management solution.	Planned	Reduce printed pages.	Software solution to monitor print utilization and cost. Guide users to reduce number of printed pages and direct high volume printing to more energy efficient/ecological devices.	
Replace old printers with EnergyStar compliant devices.	In Progress	Reduce energy used.		
Online course websites for sharing of course material.	In Progress	Reduce paper usage.	Continue to expand use of course websites.	

<b>2.4 Travel</b>				
<b>Action</b>	<b>Action Planned</b>	<b>Outcome/Performance Measure</b>	<b>Notes Clarifying Action Taken</b>	<b>Timeframe</b>
Install Video Conferencing facilities.	In Progress	Reduced travel between campuses.		
Implemented hotel offices.	Complete	Reduced travel between campuses.	For HR and IET departments.	
<b>2.5 Employee Engagement</b>				
<b>Action</b>	<b>Action Planned</b>	<b>Outcome/Performance Measure</b>	<b>Notes Clarifying Action Taken</b>	<b>Timeframe</b>
Provide climate change education.	In Progress	Provide training opportunities.		
Provide conservation education.	In Progress	Provide training opportunities.		
Provide green tips.	In Progress	Provide green tips on website.	Provide regular updates.	
Support professional development.	In Progress	Attendance at sustainable training opportunities.		
<b>2.6 Sustainability Actions (others)</b>				
<b>Action</b>	<b>Action Planned</b>	<b>Outcome/Performance Measure</b>	<b>Notes Clarifying Action Taken</b>	<b>Timeframe</b>
Take water conservation measures – low flow showers or toilets, fix leaks.	Complete		Part of our maintenance program is to ensure no leaks and that low flow devices in place and operate properly.	Ongoing
Reduce/replace bottled water with filtered or refrigerated water.	Planned			
Improve recycling measures.	In Progress		Plan to add additional recycling stations	2009
Support composting.	Planned			
Use re-usable dishes.	In Progress			
Purchase green cleaning products.	In Progress		Continue to use green cleaning products	Ongoing
Use green (low-e paints).	In Progress		Continue to use low e-paint	Ongoing
Support sustainable procurement practices.	In Progress		Weekly review and integration of opportunities	Ongoing
Adopt low-carbon contracting practices.	In Progress		We follow LEED construction practices	Ongoing
Vehicle fleet carbon offsets	In Progress		Purchased with insurance renewal	Ongoing
Electronic distribution of contract documents FTP site	In Progress			Ongoing