Kwantlen Polytechnic University - 2009 Carbon Neutral Action Report

Executive Summary

Kwantlen Polytechnic University (KPU) has a long standing commitment to environmental sustainability. Over the past 10 years, the institution has made significant investments in reducing its energy consumption and its greenhouse gas emissions. Many of these investments have now recouped their initial cost and are generating ongoing savings to KPU. As well, with the support of the Government of British Columbia, the University has added new buildings at our Surrey and Cloverdale campuses that were designed to LEED Gold standards. Furthermore, KPU has developed, and this year expanded, its geothermal field at its Surrey campus. This field now provides heating and cooling to recently constructed buildings and to the wing of the Library that was built in 1989.

KPU is in the process of developing a number of new degree programs focusing on sustainability. These include offerings in science and in urban agriculture/horticulture. As well, the University has undertaken initiatives to develop its research infrastructure with the support of Canadian Foundation for Innovation and BCKDF. These include a geothermally heated and cooled greenhouse that will act as a test site for a sustainable production greenhouse industry in British Columbia.

Finally, in the future, KPU has much work to do to educate employees and students to work with the University in its goal to become carbon neutral. To date much of the work has been undertaken by Facilities, Information and Education Technology (IET) and Supply and Business Services.

Overviews

Actions Taken to Reduce Greenhouse Gas Emissions in 2009

KPU continues to develop and implement plans to move incrementally towards carbon neutrality in the future. Current initiatives include a phased replacement of desktop computers with thin clients that use much less energy and can be used for 8-10 years. With the support of the Government of the British Columbia and the Government of Canada, the University is repairing/replacing building envelopes at its Surrey campus. This will reduce building heating and cooling costs. Also, KPU, with PSECA funding, has installed new energy efficient condensing boilers at Langley and Surrey campuses. Finally, as a multi-campus university, KPU is working to reduce travel costs between campuses incurred for meetings and for instruction. Over the next two years the University will increase its investment in video conferencing in meeting rooms, to the desktop and for external meetings.

Operational Changes in 2009

In 2009, the University tracked energy use and energy intensity per square meter. This data was benchmarked to historical energy consumption. As well, major renovations were built to LEED silver standard and designed using an integrated design process. In addition, all PC desktops are shut down automatically outside regular business hours and all PC monitors, Thin Clients and multifunction devices automatically have sleep settings applied. Multifunction devices were set for automatic double-sided printing. As well, lighting upgrades and occupancy sensors were installed in a number of buildings.

Plans to Continue Reducing Greenhouse Gas Emissions 2010 – 2012

Over the next few years, KPU will focus on the following key areas to reduce greenhouse gas emissions.

- Replacing staff, faculty and student PC desktops with Thin Clients

- Virtualization of servers
- Implementing 2010 "Energy Management Action Plan"
- Roll out of SharePoint Intranet to 100% of staff computers
- Providing video conferencing to the Desktop for both internal and external web conferencing
- Beginning retrofit of washroom faucets
- Ensuring that new construction incorporates storm water management
- Enhancing program for the reduction and diversion of building occupant waste
- Re-use building materials in major renovations
- Installing shower facilities at campus locations to encourage commuting by foot and bicycle

As in the past, the University expects that its investments in reducing greenhouse gas emissions will generate a return on investment to KPU and will contribute to our goal of achieving carbon neutrality. You will find more information about KPU's plans and current initiatives in energy and environmental management at this URL: http://www.kwantlen.ca/facilities/sustainability.html

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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 12/31/09)	Performance to Date (as of 12/31/09)		Steps Taken in 2009	Steps Planned for 2010 -2012	Start Year	End Year
Mobile Fuel Combustion (Fleet and other mobile equipment)							
Vehicle fuel efficiency							
Replace vehicles with more fuel-efficient models	Complete			replaced two 1992 service vans with new fuel-efficient models		2010	No End Date (Continuous)
Perform regular fleet maintenance to improve fuel-efficiency	Ongoing/In Progress			ongoing requirement for two new vans	ongoing requirement for two new vans	2010	No End Date (Continuous)
Other Mobile Fuel Combustion Actions							
Included electric car recharging stations at Cloverdale Campus when opened in 2007	Complete			None	We will add more plugs if needed	2005	No End Date (Continuous)
Add electric scooter recharging station at Langley Campus in 2008	Complete			None	We will add more plugs if needed	2005	No End Date (Continuous)
Stationary Fuel Combustion, Electricity and Fugitive Emissions (Buildings)							
Planning/management							
Install a real time metering system (e.g. Pulse, Reliable Controls, Houle Controls)	Ongoing/In Progress	1	% of buildings have a real time metering system installed	Installed on new research facility	Budget constraints have resulted in no additional funds for these initiatives in fiscal 2010-2011. It is expected that a budget proposal to expand real time metering will be received during the 2011-2012 budget process.	2007	No End Date (Continuous)
Owned buildings							
Establish energy performance baseline for owned buildings	Ongoing/In Progress	100	% of owned buildings have an established energy performance baseline	Energy use is tracked monthly from utility bills and energy intensity per square meter is calculated and benchmarked to historical energy consumption.	Continue program	2008	No End Date (Continuous)
Achieve LEED NC Gold certification at a minimum for new construction or major renovations	Ongoing/In Progress	17	% of owned buildings are certified LEED NC Gold or LEED NC Platinum	New buildings built to LEED Gold and major renovations to LEED silver or better.	Cloverdale Campus (17,203 M2) LEED Gold. Surrey Main (4300 M2) under review for LEED Gold. Fir Bldg Expansion (5220 M2) - equivalent LEED Gold.	2005	No End Date (Continuous)
Incorporate integrated design process into new construction or during renovations of owned buildings	Ongoing/In Progress	100	% of buildings built or renovated since start year indicated used the integrated design process	All new buildings and major renovated areas use integrated design process.	Continue process for new buildings and major renovations	2004	No End Date (Continuous)
Incorporate a refrigerant management strategy into regular building management/maintenance to reduce fugitive emissions	Ongoing/In Progress			All equipment using refrigerant is maintained on a regular basis and all refrigerant use is recorded to meet regulatory requirements.	Continue process	2000	No End Date (Continuous)
Complete energy retrofits on existing, owned buildings	Ongoing/In Progress	70	% of owned buildings have undergone energy retrofits since start year indicated	Approx 70% of buildings retrofitted in 2000	Continue process	2000	No End Date (Continuous)
Retrofitting owned buildings							

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Action	Status (as of 12/31/09)	Performance to Date (as of 12/31/09)		Steps Taken in 2009	Steps Planned for 2010 -2012	Start Year	End Year
Upgrade mechanical systems (heating, cooling, ventilation) during retrofits	Complete	100	% of retrofits (captured above) had heating, cooling, and ventilation systems upgrades	Finished in 2002		2000	No End Date (Continuous)
Upgrade lighting systems during retrofits	Complete	100	% of retrofits (captured above) had lighting systems upgrades	Finished in 2002		2000	No End Date (Continuous)
Upgrade/adjust control systems during retrofits	Complete	100	% of retrofits (captured above) had control system upgrades or adjustments	Finished in 2002		2000	No End Date (Continuous)
Improve building insulation (including windows) during retrofits	Complete	3	% of retrofits (captured above) had insulation improvements	Finished in 2002		2000	No End Date (Continuous)
IT power management							
Install power management software which shuts down computers outside of regular business hours	Ongoing/In Progress	86	% of computers shut down automatically outside of regular business hours	All the PC desktops are shut down automatically outside of regular business hours. IET have converted 60% of the student PC Desktops with Thin Clients. Although Thin Clients are never shut down, a Thin Client power consumption is 1/4 of the power consumption of a PC Desktop.	Replace staff, faculty and student PC Desktops with Thin Clients.	2007	2011
Implement server virtualization	Ongoing/In Progress	67	% of servers have been virtualized since start year indicated	Added a new Vmware ESX cluster of 4 hosting servers and 2 Solaris zoning servers to house the new virtual/zoned server requests.	To add up to 8 new Vmware ESX hosting servers and 2 new Solaris zoning servers to continue to create virtual servers instead of physical machines. As an alternative, we shall explore the potential of cloud computing in partnership as a shared service with other post secondary institutions.	2010	No End Date (Continuous)
Apply auto-sleep settings on computer monitors and CPUs	Complete	100	% of computers have auto-sleep settings applied	All monitors PC Desktops and Thin Clients automatically have sleep settings applied. We don't have auto-sleep settings applied to PC Desktops.	Plan to convert 75% of the PC desktops to thinclient technology	2006	2011
Remove stand-alone printers, copiers, and/or fax machines and install multi-function devices	Ongoing/In Progress			Installed 3 Multifunction Devices in 2009 and converted 3- Ricoh Copiers to Multifunction Devices to centralize student printing in the Surrey library.	Centralization of Student printing at the Langley and Richmond campuses. Installation of multi-function devices for faculty pods.	2010	No End Date (Continuous)
Apply auto-sleep settings on printers, copiers, fax machines, and/or multi-function devices	Complete	100	% of devices have auto-sleep settings applied	100% of all multi-function devices have auto-sleep turned on		2010	No End Date (Continuous)
Replace computers with ENERGY STAR models during regular computer upgrades	Ongoing/In Progress	80	% of computers are ENERGY STAR rated	Converted 60% of the student PC desktops with Thin Clients. All Thin Clients are Energy Star rated. 180 PC based computers were replaced with energy star 4.0 rated specifications. Approx 70 energy star LCD monitors installed.	Plan to convert 90% of all computer PC based desktops to energy saving Thin Client technology	2007	2011
Appliances and electronic devices							
Replace refrigerators with ENERGY STAR models or source ENERGY STAR models for future purchases	Ongoing/In Progress			Food Service Contract 2501 Equip Upgrades pending	Food Service Contract 2501 Equip Upgrades Pending	2010	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			Food Service Contract 2501 Equip Upgrades pending	Food Service Contract 2501 Equip Upgrades Pending	2010	No End Date (Continuous)

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Action	Status (as of 12/31/09)	Performance to Date (as of 12/31/09)	Steps Taken in 2009	Steps Planned for 2010 -2012	Start Year	End Year
Replace desk lamp incandescent bulbs with compact fluorescent (CFL) bulbs or source more efficient desk lamps for future purchases	Complete		We no longer stock incandescent screw in type bulbs for desk lamps.		2002	2010
Behaviour change program						
Ask staff to close blinds at end of work day to reduce heating/cooling demands	Ongoing/In Progress		Blinds closed by Security when security checks performed	Continue process	1993	No End Date (Continuous)
Provide reminders for turning off lights (e.g., signs, stickers, messages)	Ongoing/In Progress		Stickers replaced or added as required	Continue process	1993	No End Date (Continuous)
Promote hot water conservation	Ongoing/In Progress		Low flow aerators replaced if defective	Continue process	2004	No End Date (Continuous)
Other Stationary Fuel Combustion and Electricity Actions						
Start implementation of PSECA projects to reduce energy consumption.	Complete		-> Installed occupancy sensors on washroom lighting at Surrey Campus. -> Upgraded 6 Hvac fan motors totalling 160 HP to energy efficient models at Surrey Campus. -> Installed demand ventilation control on Kitchen exhaust hoods at Langley and Surrey Campus. -> Installed LED as a test into track lighting in one area at Langley Campus. -> Installed new Pot lighting B51technology in our conference centre to reduce wattage by 25%.		2009	2009
Final phase of implementation of PSECA projects to reduce energy consumption.	Ongoing/In Progress		-> Installed 1 new condensing boiler to serve the main heating plant at Langley Campus. -> Installed 2 new condensing boilers to serve the main heating plant at Surrey Campus. -> Upgraded lighting at Langley and Surrey Campuses		2009	2010
Revise "Energy Management Action Plan" for 2010	Ongoing/In Progress		Plan our next energy conservation work which also reduces greenhouse gases for 2010.	Implement our "Energy Management Action Plan" for 2010 and continue annual updating.	2009	No End Date (Continuous)
Develop RFP for "Energy Manager" which we plan to apply to BCHydro for funding	In Development		Develop RFP document and measurable deliverables	Issue the RFP and begin the work to achieve planned deliverables	2009	2010
Increasing the size of our GeoExchange system at Surrey Campus	Ongoing/In Progress		Design and tender	Construction	2009	2010
Added additional controls at Richmond Campus to expand demand ventilation and reduce energy consumption and reduce GHG's	Complete		Added additional controls at Richmond Campus to expand demand ventilation and reduce energy consumption and reduce GHG's	Will review Richmond and other campus locations to see if further opportunity exists	2009	2009
Retrofit library mechanical system in the original part of the library building to reduced energy consumption and reduce GHG's.	Complete		Mechanical system redesigned, work was tendered and construction work was implemented to remove the old system and install the new system		2009	2009
Switch to daytime cleaning to reduce energy consumption and reduce GHG's	Complete		Revise cleaning contract to have cleaners clean during the day when we are open and not at night after we are closed		2009	2009

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Action	Status (as of 12/31/09)	Performance to Date (as of 12/31/09)		Steps Taken in 2009	Steps Planned for 2010 -2012	Start Year	End Year
Relamp parking lot under building and all 24 hour light fixtures in hallways and common areas to 25 watt tubes to reduce energy consumption and reduce GHG's	Complete			Relamp parking lot under building and all 24 hour light fixtures in hallways and common areas to 25 watt tubes to reduce energy consumption and reduce GHG's		2009	2009
Add controls to enty heaters and kitchen exhaust fans so they can be controlled on a time schedule rather than run all the time.	Complete			Add controls to enty heaters and kitchen exhaust fans so they can be controlled on a time schedule rather than run all the time.		2009	2009
Supplies (Paper)							
Paper Type							
Purchase 30% post-consumer recycled paper	Complete			all paper purchases contain 30% or more recycled content		2010	No End Date (Continuous)
Purchase 100% post-consumer recycled paper	Ongoing/In Progress			next fine paper contract to evaluate moving to 100% recycled content	evaluate new contract and print equipment needs	2010	No End Date (Continuous)
Printer/document settings							
Switch networked printers and photocopiers to automatic double-sided	Ongoing/In Progress	75	% of network printers or photocopiers are set to automatic double-sided	Converted all MFD units to automatic double sided printing	All network printers installed will be set-up to automatic double sided by default	2010	2010
Apply "print and hold" settings to networked printers to eliminate unclaimed print jobs	In development				Will proceed with a plan analyze the print fleet to standardize "print and hold" settings where applicable	2010	2012
Electronic media in place of paper							
Install collaborative software for electronic editing (e.g. SharePoint, Groove, etc.)	In Development				Planned to roll out SharePoint intranet to 100% of staff computer in 2010.	2010	2010
Use electronic document library for filing common documents	Complete	100		Already common practice.		1995	No End Date (Continuous)
Post materials online that were previously printed	Complete	100		Already common practice.		1995	No End Date (Continuous)
Switch to an electronic payroll notification system in place of paper pay stubs	Complete	100		Implemented		2008	No End Date (Continuous)
Behaviour change program							
Train staff to use collaborative software for electronic editing (e.g. SharePoint, Groove, etc.)	In development	5			100% of staff to be trained as part of SharePoint rollout	2010	2011
Encourage staff to hold paperless meetings or presentations (i.e., no handouts)	Ongoing/In Progress			process supported by information provided by print centre	information to be added to website	2010	No End Date (Continuous)
Encourage re-use of scrap paper	Complete			available from print centre	information to be added to website	2010	No End Date (Continuous)

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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 12/31/09)	Performance to Date (as of 12/31/09)		Steps Taken in 2009	Steps Planned for 2010 -2012	Start Year	End Year
Business Travel							
Policy and budgeting							
Create a low-carbon travel policy or travel reduction goal	In Development			travel policy report presented to executive group	develop support for travel policy report	2010	No End Date (Continuous)
Virtual meeting technology							
Install web-conferencing software (e.g., Live Meeting, Elluminate, etc.)	Ongoing/In Progress	2	% of computers have web-conferencing software installed	Office Communication Server & OCS client pilot program implemented and webcams installed on all Information and Education Technology computers. The live meeting application also installed and in use both for the desktop conferencing and two meetings rooms in Surrey and Langley	Office Communication Server production infrastructure installed to support all kwantlen computers and external web conferencing. Ploycom CX 5000 systems installed on each campus to support both internal and external web conferencing	2009	2011
Make desktop web-cameras available to staff	Ongoing/In Progress	2	% of staff have access to a desktop web-camera	All IET staff have web-cameras available for use	Office Communicator Server production complete and all Kwantlen employees will be able to use web-cameras and OCS client including Live Meeting for web conferencing	2009	2011
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	Polycom CX-5000 Video-conferencing units installed in two meeting rooms, Langley and Surrey locations. Three complete Sony video conferencing classrooms installed in Richmond , Langley and Surrey campuses.	Polycom CX-5000 video conferencing units will be installed in selected meeting rooms University wide.	2009	2012
Behaviour change program							
Train staff in web-conferencing	Ongoing/In Progress	2	% of staff are trained web-conferencing	IET staff trained in web conferencing	Staff and Faculty on all campuses will have training available for both Office Communicator and Live Meeting.	2009	2012
Train staff in video-conferencing or provide technical support for video-conferencing set-up	Ongoing/In Progress	2	% of staff are trained in video-conferencing or have access to technical support	Approx five faculty members have been trained and use in video conferencing for course delivery weekly. IET supports video conferencing in both meeting and classroom environments	As more programs adopt video conferencing for course delivery additional training will be provided as required.	2009	2012
Encourage staff to consider virtual attendance/presentation at events where possible	Ongoing/In Progress			IET avoided travel to 2 conferences by selecting virtual option. Online demos and meetings with vendors have become regular practice.	Continue to encourage virtual events across the university.	2009	No End Date (Continuous)
Encourage carpooling to meetings	Ongoing/In Progress			Already common practice	Continue to promote university wide.	2000	No End Date (Continuous)
Encourage alternative travel to meetings (e.g., bicycles, public transit, walking)	Ongoing/In Progress			Already common practice	Continue to promote university wide.	2000	No End Date (Continuous)
Education, Awareness, and Engagement							
Staff Professional Development							
Support green professional development (e.g., workshops, conferences, training)	Ongoing/In Progress			The University is developing 2 degree programs in the area of sustainability.	Complete degree proposals in 2010 and launch degrees in 2011 or 2012.	2009	2012
Staff awareness/education							

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Action	Status (as of 12/31/09)	Performance to Date (as of 12/31/09)	Steps Taken in 2009	Steps Planned for 2010 -2012	Start Year	End Year
Provide green tips on staff website or in newsletters	In Development		Continue upgrade of site	Continue process	2002	No End Date (Continuous)
Client/public awareness/education						
Provide education to clients/public about the science of climate change	In Development		The University is developing 2 degree programs in the area of sustainability.	Complete degree proposals and launch degrees in 2011 or 2012.	2009	2012
Provide education to clients/public about the conservation of water, energy, and raw materials	Ongoing/In Progress		The University is developing 2 degree programs in the area of sustainability.	Complete degree proposals and launch degrees in 2011 or 2012.	2009	2012
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		Continue process	Begin retrofit of washroom faucets	2007	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			Continue to use Xeriscape landscaping in landscape renovations.	2005	No End Date (Continuous)
Introduce a stormwater management landscape strategy (e.g., vegetated roofs, permeable paving, rain gardens, bioswales)	Ongoing/In Progress		New ISH research lab project incorporated stormwater management.	Ensure new construction incorporates stormwater management as well as major landscaping retrofits	2006	2009
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		Continued program	Enhance program	1994	No End Date (Continuous)
Implement a hazardous waste reduction and disposal strategy	Ongoing/In Progress		Minimize hazardous products used. Dispose through recycling and or safe disposal practice.	Ongoing process	1993	No End Date (Continuous)
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		green procurement index established	coordination of green procurement index within Kwantlen	2010	No End Date (Continuous)
Implement sustainable purchasing program for cleaning products, disposable paper products and trash bags	Ongoing/In Progress		Standardization of cleaning products.	Re-evaluate program	2007	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		new food service contractor reports 20% of purchases of sustainable or organic food	service level agreement to be established and evaluated with new food service contractor	2010	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		New construction and renovation diverts debris from landfill. Re-use building materials where practical	Re-use building materials in major renovations	2005	No End Date (Continuous)
Incorporate lifecycle costing into new construction or renovations	Ongoing/In Progress		We use life cycle costing where appropriate to determine most suitable products for renovations and construction	Continue process	2005	No End Date (Continuous)
Indoor air quality						

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Enforce a scent-free policy (e.g., no strong perfumes, deodorants, etc.)	Ongoing/In Progress		We have implemented an education program to make employees and students aware of the issues.	Continue education.	2008	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		Continued purchase of low VOC products including majority of furniture and flooring	Continue process	2005	No End Date (Continuous)
Commuting to and from home						
Encourage commuting by foot, bicycle, carpool or public transit	Complete		Already common practice.		2000	No End Date (Continuous)
Provide shower or locker facilities for staff/students who commute by foot or by bicycle	Ongoing/In Progress		Showers installed in new ISH research facility	Continue expansion of shower facilities	1992	No End Date (Continuous)
Provide secure bicycle storage	Complete		No new actions necessary		1992	2010
Modify parking fees or parking availability for staff/students	Ongoing/In Progress		reviewed sustainable transportation opportunities with Translink	provide strategic parking plan to Senior Leadership	2010	No End Date (Continuous)