

#### **Executive Summary**

Environmental leadership has been a long term priority for Kwantlen Polytechnic University. KPU is proud of the accomplishments to date and committed to continued leadership as identified in KPU's new Mission & Mandate.

"Through program delivery, services, and research initiatives, we aspire to inform and transform attitudes and values to reflect our role as a responsible and sustainable educational institution. Our health and our achievements derive from, and depend upon, the health of the Earth and its inhabitants."

Energy use at KPU is low as confirmed by National Research Canada benchmark data for energy intensity per square meter (eGJ/m2). Kwantlen currently uses 69% less energy than a typical university and 44% less than a typical college.

Additional educational offerings in science and in urban agriculture/horticulture focusing on sustainability are currently being developed.

Kwantlen has undertaken initiatives to develop its research infrastructure with the support of Canadian Foundation for Innovation and British Columbia Knowledge Development Fund. A geo-thermally heated and cooled greenhouse will be a test site for sustainable production in the greenhouse industry in British Columbia.

Facilities services continue to focus on reductions of GHG emissions and energy consumption. Kwantlen has developed, and this year expanded, its geo-exchange field at its Surrey campus providing heating and cooling to over 9,300 square metres of recently constructed buildings and to the portion of the Library that was built in 1990.

#### Anticipated benefits related to reducing energy use and greenhouse gases

Detailed energy records of energy consumption have been prepared back to 1994 to track and benchmark key performance parameters. Since the established base year of 2000 over \$2,333,314 in energy costs have been avoided. In 2010 cost avoidance for energy was \$400,096. This is especially significant in that Kwantlen has added 20% more space and utility rates are higher than 10 years ago.

#### 2010 Greenhouse Gas Emissions

Kwantlen's 2010 total emissions from all sources as reported by SMARTTool are 2479.95 tCO₂e for a reduction of 11% from 2009 emission levels.

Out of scope emissions totaling 20.32  $tCO_2e$  and representing less than 1% of our total emissions were generated by Kwantlen's seven vehicles and power washing equipment.

#### Offsets Applied to be Carbon Neutral In 2010

We have completed our Carbon Offset Purchase Order Form from Pacific Carbon Trust and purchased carbon offsets for total emissions as identified in SMARTTool for the total emissions calculated for 2010.

#### **Emission Reductions Activities**

#### Key actions to reduce greenhouse gas emissions in 2010

With funding support from the Public Sector Energy Conservation Agreement (PSECA) two new condensing boilers were installed at the Surrey Campus and a new condensing boiler was installed as the main boiler at the Langley Campus. In 2010 our natural gas consumption for a partial year's consumption was reduced by 11% from 2009 which is 5,195 GJ.

With the support of the Provincial and Federal government, Kwantlen is upgrading building envelopes at the Surrey campus. This will contribute to a reduction in building heating and cooling requirements.

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.

Lighting upgrades and occupancy sensors were installed in a number of buildings.

#### Planning activities for 2010

Ongoing monitoring of energy consumption with comparisons to previous years consumption and benchmarking to other organizations help to confirm that initiatives undertaken have achieved their targeted savings and to ensure that ongoing operational efficiencies are maintained. There is continual exploration of additional projects to further reduce energy consumption. A Resource Management Action Plan is prepared annually summarizing actions to date and future potential projects.

#### 2011 – 2013 Plans to continue reducing greenhouse gas emissions.

#### Facilities

- Increased Energy Awareness through the Energy Manager is funded by BCHydro.
   Estimated potential of 2% reduction in electrical and natural gas consumption.
- Add interval meters that will monitor instantaneous natural gas and electrical use which will help maintain existing savings and identify potential areas for new energy savings measures.
- Continue to integrate energy efficiency into renewal plans for building equipment and systems.
- Continue implementation of projects identified in our Energy Management Action Plan.

Kwantlen CNAR 2010 Page 2

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- Replacing staff, faculty and student PC desktops with Thin Clients.
- Virtualization of servers.
- Roll out of SharePoint Intranet to 100% of staff computers.
- Providing video conferencing to the Desktop for internal and external web conferencing.

#### Organizationally

- Kwantlen is working to reduce travel costs between campuses incurred for meetings and for instruction through increased use of video conferencing.
- Over the next two years Kwantlen will increase investment in video conferencing in meeting rooms, to the desktop and for external meetings.
- Langley west wing renovations provide two additional video conference meeting rooms.

#### Operational considerations in 2010 that impact GHG emissions

#### New Construction and Renovations

Replace building envelopes at Surrey Campus.

#### Increased Student Enrollment and Facilities Usage

Our student enrollment has increase by more than 10% since the 2007 base year. This growth in students increases our staffing requirements and impacts factors affecting GHG production increasing our GHG emissions.

#### **Energy Intensity Benchmarking Per Square Meter**

Kwantlen records energy use and energy intensity per square meter to measure energy efficiency relative to building size. The energy intensity data is used to compare on a unit basis by square meter of building area to external benchmark data such as NRCan to compare KPU's energy efficiency to other University benchmark data.

#### Links to Kwantlen Documents with Publically Available Sustainability Information

Further information about Kwantlen's plans and current initiatives in energy and environmental management are available at the URLs below:

**Facilities** 

Facilities web site: http://www.kwantlen.ca/facilities/sustainability.html

Utility records 2010 Energy Management Action Plan 2010

Supply and Business Services

Green Index: <a href="http://kwantlen.ca/supply/green.html">http://kwantlen.ca/supply/green.html</a>

Signature

Vice President Finance & Administration

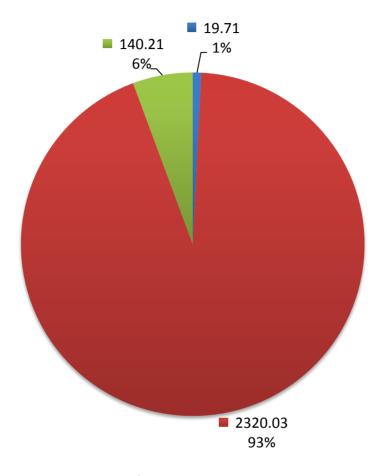
March 21, 2011

Date

Kwantlen CNAR 2010 Page 3

### Kwantlen Polytechnic University

Greenhouse Gas Emissions by Source for the 2010 Calendar Year (tCO<sub>2</sub>e\*)



**Total Emissions: 2479.95** 

- Mobile Fuel Combustion (Fleet and other mobile equipment)
- Stationary Fuel Combustion and Electricity (Buildings)
- Supplies (Paper)

#### Offsets Applied to Become Carbon Neutral in 2010

Total offsets purchased: 2478.57. Total offset investment: \$61,964.25. Emissions which do not require offsets: 1.38 \*\*

<sup>\*</sup>Tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e) 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.

<sup>\*\*</sup> Under the Carbon Neutral Government Regulation of the Greenhouse Gas Reduction Targets Act, all emissions from the sources listed above must be reported. As outlined in the regulation, some emissions do not require offsets.

# **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 12/31/10)		Performance to Date (as of 12/31/10)	Steps Taken in 2010	Steps Planned for 2011 -2013	Start Year	End Year	
Mobile Fuel Combustion (Fleet and other mobile equipment)								
Behaviour change program								
Introduce anti-idling policy and/or raise anti-idling awareness for fleet drivers (e.g., signs, stickers, messages)	Ongoing/In Progress			Information package circulated annually for all vehicles for anti idling awareness.	"Idle Free BC" Vehicle stickers and information package to be provided for all fleet vehicles and drivers.	2010	No End Date (Continuous)	
Encourage carpooling in fleet vehicles	Ongoing/In Progress			Carpool designated parking and reduced carpool parking rate incentives provided.	Carpool designated parking and reduced carpool parking rate incentives provided.	2010	No End Date (Continuous)	
Promote alternatives to fleet vehicle travel where possible (e.g., bicycles, public transit, walking)	In Development			Employee Transit Pass program under development for 2011.	Employee Transit Pass program under development for 2011.	2010	No End Date (Continuous)	
Stationary Fuel Combustion, Electricity and Fugitive Em	nissions (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	Have included analysis of needs in scope of "Energy Manager" work planned for 2011/12. Preliminary planning to begin installation of interval metering has been completed.	By year end target to have interval metering for minimum of 25% of our buildings.	2007	No End Date (Continuous)	
Owned buildings								
Establish energy performance baseline for owned buildings	Ongoing/In Progress			Energy use is tracked monthly from utility bills and energy intensity per square meter in calculated and benchmarked to historical 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	All new buildings built to LEED Gold and major renovations to LEED Silver or better. Major renovation of Richmond Library and Langley West Wing in progress and to achieve LEED Silver or better.	Continue process for new buildings and major renovations	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 including SUB building, Richmond campus refurbishment and former Langley Trades wing retrofit.	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 refrerant 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	We maintain a program of continuous improvement and regularily implement energy conservation projects. In 2010 we performed six energy efficiency projects.	Continue processes	2000	No End Date (Continuous)	
Retrofitting owned buildings								
Improve building insulation (including windows) during retrofits	Ongoing/In Progress	24	% of retrofits since start year indicated had insulation improvements	We are replacing building envelopes with higher performance envelop systems and windows, and increasing roof insulation at Surrey Campus on the Birch and Fir buildings which were constructed in 1990.	Continue and complete projects at Surrey Campus	2000	No End Date (Continuous)	

Action	Status (as of 12/31/10)	Performance to Date (as of 12/31/10)		Steps Taken in 2010	Steps Planned for 2011 -2013	Start Year	End Year
IT power management							
Install power management software which shuts down computers outside of regular business hours	Ongoing/In Progress	95	% of computers shut down automatically outside of regular business hours	All our PC desktops are shut down automatically outside of regular business hours. We have converted 90% 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.	No Actions taking other than expanding the Thin Client implementaion into the Staff areas which will cut the power consumption per computer 1/4 of a standared computer	2010	2013
Implement server virtualization	Ongoing/In Progress	80	% of servers have been virtualized since start year indicated	80 % of new Servers provisioned in 2010 have been virtualized	All new servers requested will be virtualized unless there is an requirement for a Hardware server	2010	No End Date (Continuous)
Apply auto-sleep settings on computer monitors and CPUs	Ongoing/In Progress	50	% of computers have auto-sleep settings applied	100% of monitors and 50% of computers have autosleep	Expanded implementaion of Thin Clients in staff areas will auto-sleep enabled which will bring the percentage up to 70%	2010	2013
Remove stand-alone printers, copiers, and/or fax machines and install multi-function devices	Ongoing/In Progress	75	% reduction in printers, copiers, and/or fax machines since start year indicated	All workgroup printers are multi-function devices.	Continue to install MFD for workgroup areas.	2010	No End Date (Continuous)
Apply auto-sleep settings on printers, copiers, fax machines, and/or multi-function devices	Ongoing/In Progress	75	% of devices have auto-sleep settings applied	All multi-function devices are delivered with this setting.	All multi-function devices are delivered with this setting.	2010	No End Date (Continuous)
Replace computers with ENERGY STAR models during regular computer upgrades	Ongoing/In Progress	100	% of computers are ENERGY STAR rated	All new computers purchased 80 Plus certified and Monitors are Energy star certified.	Continue to purchase energy certified equiptment.	2010	No End Date (Continuous)
Appliances and electronic devices							
Replace refrigerators with ENERGY STAR models or source ENERGY STAR models for future purchases	Completed in 2010			All coin operated vending equipment upgraded with energy star models in 2010.		2010	No End Date (Continuous)
Replace other appliances or electronic devices with ENERGY STAR models or source ENERGY STAR models for future purchases	Completed in 2010			All MFD copier prints replaced with energy star models.		2010	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.	Started before 1995	No End Date (Continuous)
Provide reminders for turning off lights (e.g., signs, stickers, messages)	Ongoing/In Progress			Stickers replaced and added as required.	Continue process.	Started before 1995	No End Date (Continuous)
Promote hot water conservation	Ongoing/In Progress			Low flow aerators inspected routinely and replaced if missing or defective. All faucets have low flow aerators.	Continue process.	2004	No End Date (Continuous)
Supplies (Paper)							
Paper Type							
Purchase 100% post-consumer recycled paper	In Development				Under review by Print Centre for 2011.	2011	No End Date (Continuous)
Printer/document settings							
Switch networked printers and photocopiers to automatic double-sided	Ongoing/In Progress	80	% of network printers or photocopiers are set to automatic double-sided	All network printers are setup to default to automatic double sided when installed.	All network printers are setup to default to automatic double sided when installed.	2010	No End Date (Continuous)

Action	Status (as of 12/31/10)	Performance to Date (as of 12/31/10)	Steps Taken in 2010	Steps Planned for 2011 -2013	Start Year	End Year
Apply "print and hold" settings to networked printers to eliminate unclaimed print jobs	Ongoing/In Progress	% of network printers have 'print and hold' settings applied	Print and hold settings are implemented on all Multifunction devices installed in public areas.	Print and hold settings will be implemented on MFD's in public areas.	2003	No End Date (Continuous)
Electronic media in place of paper						
Install collaborative software for electronic editing (e.g. SharePoint, Groove, etc.)	In Development	% of staff workstations with software installed	Installation of Sharepoint Infrastructure.	Move to Sharepoint for collaboration, electronic editing and departmental websites.	2010	2012
Behaviour change program						
Train staff to use collaborative software for electronic editing (e.g. SharePoint, Groove, etc.)	Ongoing/In Progress	% of staff currently have received collaborative software training	Installation of Sharepoint Infrastructure.	Move to Sharepoint for collaboration, electronic editing and departmental websites.	2010	2012
Encourage re-use of scrap paper	Ongoing/In Progress		2000+ scrap paper note-pads produced and used annually.	2000+ scrap-paper note-pads produced in-house and available for all Kwantlen departments.	2010	No End Date (Continuous)

### **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 12/31/10)		Performance to Date (as of 12/31/10)	Steps Taken in 2010	Steps Planned for 2011 -2013	Start Year	End Year
Business Travel							
Policy and budgeting							
Create a low-carbon travel policy or travel reduction goal	In Development				Kwantlen's travel policy is currently being revised. The revised policy will be implemented in the new fiscal year.	2011	No End Date (Continuous)
Virtual meeting technology							
Install web-conferencing software (e.g., Live Meeting, Elluminate, etc.)	Ongoing/In Progress	1	% of computers have web- conferencing software installed	Completed IET 60 staff computers in 2010 with OSC and Live Meeting.	90% of Staff computers will have web conferencing software installed.	2010	2012
Make desktop web-cameras available to staff	Ongoing/In Progress	1	% of staff have access to a desktop web-camera	Web-cameras installed on all IET 60 Computers staff computer.	Web cameras will be avalable for 90% staff computers.	2010	2012
Install video-conferencing units in meeting rooms or provide mobile video-conferencing units	Ongoing/In Progress	1	% of meeting rooms have access to video-conferencing equipment	Usability upgrades to three video conferencing installations and an addition of one more video conferencing meeting room.	Expansion to include two more tier one video conferencing installations and three tier two webconferencing meeting rooms.	2010	2012
Behaviour change program							
Train staff in web-conferencing	Ongoing/In Progress	1	% of staff are trained web- conferencing	IET staff trained and University Faculty using the present web conferencing installations.	90% of staff will have the ability to access on-line training for Microsoft Live meeting and OCS.	2010	2012
Train staff in video-conferencing or provide technical support for video-conferencing set-up	Ongoing/In Progress	1	% of staff are trained in video- conferencing or have access to technical support	On-site IET Campus Support Technologists are trained.	Plan to hire a Multimedia Coordinator to expand the training plan.	2010	2012
Encourage staff to consider virtual attendance/presentation at events where possible	Ongoing/In Progress			The University is building video conference facilities on each campus as well as implementing desktop video conferencing. These are currently being piloted.	Full implementation including encouraging staff behavior changes will be undertaken in 2011-12.	2010	No End Date (Continuous)
Encourage carpooling to meetings	Ongoing/In Progress			Carpooling is encouraged through preferential parking.	Continue practice.	2007	No End Date (Continuous)
Encourage alternative travel to meetings (e.g., bicycles, public transit, walking)	In Development				The University is planning to implement an intercampus shuttle service during 2011.	2011	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 initial planning for this was completed in November 2010.	The University will establish a broad-based Green Campus Initiative in 2011.	2010	No End Date (Continuous)
Provide resources and/or dedicated staff to support teams	In Development				This Committee will be resourced through the Office of the Vice President Finance and Administration.	2011	No End Date (Continuous)
Awards/Recognition							
Establish a sustainability/green awards or recognition program	In Development				No initiatives planned at present. The new Environmental committee will consider.	2011	No End Date (Continuous)

Action	Status (as of 12/31/10)	Performance to Date (as of 12/31/10)	Steps Taken in 2010	Steps Planned for 2011 -2013	Start Year	End Year
Staff awareness/education						
Provide education to staff about the science of climate change	In Development			Kwantlen's new degree programs in Policy Studies will focus on sustainability. It will be implemented in 2011. A BSc in sustainable urban agriculture is under development. Establishing these degrees is providing educational opportunities to both faculty and staff.	1 7011 1	No End Date (Continuous)
Provide education to staff about the conservation of water, energy, and raw materials	In Development			Kwantlen's new degree programs in Policy Studies will focus on sustainability. It will be implemented in 2011. A BSc in sustainable urban agriculture is under development. Establishing these degrees is providing educational opportunities to both faculty and staff.	1 7011 1	No End Date (Continuous)
Provide green tips on staff website or in newsletters	In Development			This will be the responsibility of the Green Initiatives Committee.	2011	No End Date (Continuous)
Provide sustainability education during new staff orientation	In Development			This will be the responsibility of the Green Initiatives Committee.	2011	No End Date (Continuous)
Client/public awareness/education						
Provide education to clients/public about the science of climate change	In Development			New degrees will make a major contribution to this.	2011	No End Date (Continuous)
Provide education to clients/public about the conservation of water, energy, and raw materials	In Development			New sustainability related degrees will make a significant contribution to this.	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		Hands free low flow faucets installed in high use washrooms at all campuses.	Continue retro-fits.	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		All Landscape modification are xeriscape landscaping	Upgrade landscaping adjacent to four buildings at Surrey campus.	2005	No End Date (Continuous)
Introduce a stormwater management landscape strategy (e.g., vegetated roofs, permeable paving, rain gardens, bioswales)	Ongoing/In Progress		Continue process.	Continue process.	2006	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		Continued program.	Continue program.	Started before 1995	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 practices.	Continue program.	Started before 1995	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		Consumables and products are evaluated and documented for environmental impact on the Purchasing Green Index.	Continue program.	2010	No End Date (Continuous)

Action	Status (as of 12/31/10)	Performance to Date (as of 12/31/10)	Steps Taken in 2010	Steps Planned for 2011 -2013	Start Year	End Year
Establish green standards for goods that are replaced infrequently and/or may require capital funds to purchase (e.g., office furniture, carpeting, etc.)	In Development		Furniture, carpet and paint products selected included green standards as selection criteria.	We plan to begin to formalize written standards that will identify requirements by category i.e. office furniture.	2010	No End Date (Continuous)
Implement sustainable purchasing program for cleaning products, disposable paper products and trash bags	Ongoing/In Progress		Continue using green cleaning products and processes.	Will develop written standards that products must comply with by category.	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		2010 Food Service Contract requires compliance and reporting of sustainable products including organic, ocean wise and local sourcing.	Continue process.	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 diverted debris from the landfill and reused building materials where practical.	This will be addressed through department practices rather than policy.	2005	No End Date (Continuous)
Incorporate lifecycle costing into new construction or renovations	Ongoing/In Progress		We used life cycle costing where appropriate to determine most suitable products for renovations and construction.	Continue process.	2005	No End Date (Continuous)
Indoor air quality						
Incorporate low volatile organic compounds (VOCs) standards into procurement policy for products such as paints, carpets, and furniture	In Development		New construction and renovation projects use low VOC products.	Expand our program more broadly to include our repairs and maintenance with formalized standards.	2005	No End Date (Continuous)
Commuting to and from home						
Introduce telework/work from home policy	Ongoing/In Progress		Pilot was started in IT Department.	Evaluate results and consider continuing.	2010	No End Date (Continuous)
Offer staff a compressed work week	Ongoing/In Progress		Some pilots are underway.	Evaluate results and consider continuing.	2010	No End Date (Continuous)
Encourage commuting by foot, bicycle, carpool or public transit	Ongoing/In Progress		Planning has been completed to establish an intercampus shuttle service. Students have approved U-Pass.	University is exploring employee transit pass program.	2010	No End Date (Continuous)
Provide shower or locker facilities for staff/students who commute by foot or by bicycle	Ongoing/In Progress		Continue to review and include in projects	Continue expansion of shower facilities.	Started before 1995	No End Date (Continuous)
Modify parking fees or parking availability for staff/students	In Development			New incentive parking rates providing subsidized sustainable transit alternatives under development for 2011.	2011	No End Date (Continuous)