



BRITISH COLUMBIA  
INSTITUTE OF TECHNOLOGY  
3700 WILLINGDON AVENUE  
BURNABY, BRITISH COLUMBIA  
CANADA V5G 3H2

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# BCIT - 2009 Carbon Neutral Action Report

## Executive Summary

British Columbia Institute of Technology is the largest polytechnical institute in Western Canada and a recognized leader. BCIT's vision and commitment to the integrity of the economic, social and environmental prosperity of British Columbia has inspired the innovative approach to integrating sustainability into the Institute. BCIT's 5-Forward Strategic Plan has an environmental sustainability objective which states " ...Provide a safe and healthy environment for our employees, students, and for the communities where we live and operate by integrating sound environmental practices into our business decisions; and by establishing quantifiable goals and accountabilities for environmental performance in accordance with the BC Climate Action plan;". This mandate clearly states BCIT's commitment to moving towards Carbon Neutrality.

In order to be successful, BCIT is committed to incorporating sustainability into every aspect of its curriculum, applied research and operations as part of its larger institutional commitment to support the emerging BC green economy. Hence the creation of the Greening Campus initiative is to showcase BCIT's leadership in sustainability education and applied research through creation of campuses that offer living laboratories of environmental stewardship and sustainability practices. The greening campuses strategic plan articulates aspirational goals, such as being greenhouse gas neutral, net energy producer, zero waste, and water balanced.

## Overviews

### Actions Taken to Reduce Greenhouse Gas Emissions in 2009

Key initiatives taken between January 1, 2009 and December 31, 2009 to reduce Greenhouse Gas Emissions are listed below:

- BCIT became a Power Smart Partner, and signed the Energy Conservation Pledge.
- Awareness and education campaign on energy conservation and climate change, informed over 3,200 people.
- New construction of SW01 Gateway building incorporated BCIT's sustainability charter in the planning phase
- The Downtown Campus building automation system was recently upgraded
- Pilot project of the Micro-grid network on the Burnaby campus to create program the load demands of building NE-25 and the Maquinna residence.
- T5 lighting upgrade for the Great hall, on the Burnaby Campus
- Installed LED light in Tim Horton's on the Burnaby Campus
- In the process of developing proposal for campus wide energy audit based on Stantec's Energy Study.
- Drafted BCIT's sustainability policy, and GHG and energy management policy
- Power saving software deployed on 4000 computers.
- Paper reduction campaign conducted to reduce 20% of paper consumption.



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## Plans to Continue Reducing Greenhouse Gas Emissions 2010 – 2012

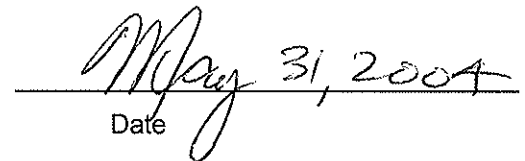
Key areas of greenhouse gas reduction BCIT will be focusing on, going forward, over the next three years are:

- Using the smart Micro-grid infrastructure to inform strategies for energy savings.
- In January 2010, a contest was held for the student residences which had an average energy reduction of 20%, more than 30,000kWh was conserved.
- During the Olympics, there was a power down of non-essential electrical equipment when the campus was closed. Facilities, food services, and micro-grid staff got involved to disconnect the equipment. More than 550,000kWh of electricity was saved during two weeks.
- Conduct annual power down during holidays, reading week, and in the summer.
- Energy monitoring at the building level in the Sustainability Precinct area (North east corner of the Burnaby Campus).
- Conduct campaign to encourage turning off lights when occupants are not in the room.
- BCIT is considering biomass system (waste-to-energy) system.
- General awareness campaign on the new vision for energy management.
- Official and systematic training for all custodial staff and safety and security on actions to help reduce energy consumption.
- Cold water clothes washing price signal strategy for student residences.
- Explore demand for hot water.
- Lighting re-design pilot project for buildings NE-02, NE-04.
- Review of the Great Hall light controls.
- Create Green Revolving Loan Fund to support environmental initiatives



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Executive Signature



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Date

# BCIT - 2009 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 12/31/09)	Performance to Date (as of 12/31/09)		Steps Taken in 2009	Steps Planned for 2010 -2012	Start Year	End Year
<b>Mobile Fuel Combustion (Fleet and other mobile equipment)</b>							
<b>Vehicle fuel efficiency</b>							
Replace vehicles with more fuel-efficient models	In Development				This is a purchasing criteria, however the planned program is awaiting for funding.	2010	No End Date (Continuous)
Perform regular fleet maintenance to improve fuel-efficiency	Ongoing/In Progress	100	% of vehicles are subject to regular maintenance for fuel efficiency	This has been common practice at BCIT prior to 2009.	The plan is to continue regular maintenance checks.	2004	No End Date (Continuous)
Replace small maintenance vehicles with more fuel-efficient models	In Development				In the near future to purchase electric carts to assist with commuting on the Burnaby campus	2010	No End Date (Continuous)
<b>Behaviour change program</b>							
Provide fleet driver training to reduce fuel use	Ongoing/In Progress	100	% of current drivers are trained	This has been common practice at BCIT prior to 2009.	The plan is to continue to conduct fleet driver training to reduce fuel use to new employees	2004	No End Date (Continuous)
Encourage carpooling in fleet vehicles	Ongoing/In Progress			This has been common practice at BCIT prior to 2009.	The plan is to continue to encourage fleet car pooling	2004	No End Date (Continuous)
Promote alternatives to fleet vehicle travel where possible (e.g., bicycles, public transit, walking)	Ongoing/In Progress			This has been common practice at BCIT prior to 2009.	The plan is to continue to encourage alternative modes of transportation	2004	No End Date (Continuous)
<b>Stationary Fuel Combustion, Electricity and Fugitive Emissions (Buildings)</b>							
<b>Planning/management</b>							
Enrol in a building energy benchmarking program (e.g., GREEN UP)	Ongoing/In Progress			BCIT became a Power Smart Partner, which is a pledge on energy conservation.	BCIT's Energy goal to reduce 5% of energy use from previous year, and strategically create funding to support initiatives, such as training, awareness campaigns, monitoring, operations, special projects, and research and education.	2010	2012
Reduce office space (square meters) per employee	In Development				G.O.S method will be implemented in new SW1 Gateway building, as a pilot project. Eventually the reduction program will be extend to all campuses.	2010	No End Date (Continuous)
Install a real time metering system (e.g. Pulse, Reliable Controls, Houle Controls)	Ongoing/In Progress	12	% of buildings have a real time metering system installed	Phase 1: Construction of Microgrid (2008-2010) *Installation of Smart Metering on designated loads *Installation of Load Control Devices in Afresh/Dorms *Installation of Comm Network (HAN/LAN/WAN) *Completion of Co-Gen and the required sensors/CTRL *Completion of protection/islanding of BCIT Campus *Retrofitting and Integration of AFRESH with Microgrid *Development of BCIT EMS system (target 10% annual saving)	Phase 2: Research and Development (2010-2015) Setup of NSERC Strategic Network (BCIT is the lead, UoNB, McGill, UoT, UoWO, UoA, UBC, SFU & UVIC)	2008	2012
<b>Owned buildings</b>							

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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
Establish energy performance baseline for owned buildings	In Development				4 buildings were audited by students under the supervision of a Professional Engineer. A submission was made to conduct campus wide energy audit.	2009	2012
Register for performance labelling/certification for commercial interiors of owned buildings (e.g., LEED CI)	In Development				LEED silver will be attained for the new SW1 Gateway building and then be applied in retrofitting schedule of existing buildings.	2010	No End Date (Continuous)
Achieve LEED NC Gold certification at a minimum for new construction or major renovations	In Development				Planned for the new SW1 Gateway Building to achieve LEED Gold equivalent	2010	2011
Incorporate integrated design process into new construction or during renovations of owned buildings	In Development				Planned for the new SW1 Gateway Building to have an integrated planning process.	2010	2011
Complete energy retrofits on existing, owned buildings	In Development				Once the campus wide energy audit is conducted, an assesment of each building retrofit will be done. Currently the North sector of the Burnaby campus will have energy retrofits done, to meet sustainabilty precint goals.	2010	No End Date (Continuous)
<b>Retrofitting owned buildings</b>							
Upgrade mechanical systems (heating, cooling, ventilation) during retrofits	Ongoing/In Progress	8	% of retrofits (captured above) had heating, cooling, and ventilation systems upgrades	Timers were added to portable A/C units. Building SE-08, has a new boiler which recovers heat, higher efficiency system.	Two buildings will have ventilation upgrades.	2004	No End Date (Continuous)
Upgrade lighting systems during retrofits	Complete	100	% of retrofits (captured above) had lighting systems upgrades	Lightin upgrade was done in the Great Hall on the Burnaby campus, light were converted to T5. LED lights were installed in Tim Hortons on the Burnaby campus.		2007	2009
Upgrade/adjust control systems during retrofits	Ongoing/In Progress	5	% of retrofits (captured above) had control system upgrades or adjustments	The down town campus building automation system was upgraded. The recommissioning of building NE-01 was started. On the Burnaby Campus SW5 was reprogrammed	Burnaby's North Campus DDC was reviewed.	2010	No End Date (Continuous)
Install an on-site renewable energy demonstration project	Ongoing/In Progress	1	% of retrofits (captured above) had on-site renewable energy components	The existing geothermal system, installed in the AFRESH demonstration building, had some components upgraded.	Solar panels were installed on the AFRESH house, to add to existing panels. A 5kw wind turbine will be installed on the Burnaby campus.	2006	No End Date (Continuous)
<b>IT power management</b>							
Install power management software which shuts down computers outside of regular business hours	In Development	100			We have revised new Microsoft software to help with this task.	2009	No End Date (Continuous)
Implement server virtualization	Complete	100	% of servers have been virtualized since start year indicated	128 servers were decomissioned and now they are replaced with 6 virtual hosting servers.		2008	2009
Apply auto-sleep settings on computer monitors and CPUs	Complete	100	% of computers have auto-sleep settings applied	4000 computers were changed to have auto-sleep settings		2008	2009
Remove stand-alone printers, copiers, and/or fax machines and install multi-function devices	Ongoing/In Progress	50	% reduction in printers, copiers, and/or fax machines since start year indicated	50 fax lines have been removed.	There are more planned for the following year.	2009	2012
Replace computers with ENERGY STAR models during regular computer upgrades	Ongoing/In Progress			1088 CRTs were replaced with LCDs . 1000 older computers were replaced with EPA 88+ computers.	Any new computer purchase will have an energy star rating. BCIT is moving towards a 1 computer policy per employee (laptops will be encouraged).	2008	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
<b>Appliances and electronic devices</b>							
Replace refrigerators with ENERGY STAR models or source ENERGY STAR models for future purchases	In Development				Tim hortons on campus has energy star refridgeration unit. Pepsi will be integrating new fridges that energy efficient.	2009	No End Date (Continuous)
Replace other appliances or electronic devices with ENERGY STAR models or source ENERGY STAR models for future purchases	In Development				The new SW1 Gateway building will have energy star appliances. And future purchases of new appliances and electronic equipment will have energy star rating or equivalent.	2010	No End Date (Continuous)
<b>Behaviour change program</b>							
Ask staff to unplug electrical equipment or switch off power bars when not in use	In Development				During the "turn the light off" campaign, the awareness of other energy saving activities such as turning off electrical equipment that is not necessary after regular work hours will be promoted as well.	2010	2011
Provide tips to staff on saving energy in the office while working outside of regular business hours	In Development				During the "turn the light off" campaign, the awareness of other energy saving activities such as turning off electrical equipment that is not necessary while away from the office will be promoted as well.	2010	2011
Provide reminders for turning off lights (e.g., signs, stickers, messages)	In Development				During the "turn the light off" campaign, stickers/signs will be used as one community base social marketing to remind people to turn off the lights and/or equipment.	2010	2011
Promote hot water conservation	Ongoing/In Progress			Planning for low flow fixtures in Gym, and Student residences.	Student residences will install low flow fixtures and faucet hydrators. And gym will eventually have low flow shower heads for mens locker room	2008	2011
<b>Supplies (Paper)</b>							
<b>Paper Type</b>							
Purchase 30% post-consumer recycled paper	Complete	100	% of total paper purchased contains 30% recycled content	This has been common practice at BCIT since 1995, to purchase paper with 30% recycled content.		1995	No End Date (Continuous)
<b>Printer/document settings</b>							
Switch networked printers and photocopiers to automatic double-sided	Ongoing/In Progress	25	% of network printers or photocopiers are set to automatic double-sided	The School of Construction and Environment piloted this initiative.	Other departments have decide to follow the lead. And the plan would be to encourage other departments to change their printer settings for double side printing.	2008	No End Date (Continuous)
Reduce default margin size in standard document templates (e.g., letters, briefing notes, forms, etc.)	In Development				The School of Construction and Environment plans on piloting this initiative.	2011	No End Date (Continuous)
<b>Electronic media in place of paper</b>							
Install collaborative software for electronic editing (e.g. SharePoint, Groove, etc.)	Complete	100	% of staff workstations with software installed	This has been common practice within BCIT's editing department.		2005	No End Date (Continuous)
Use electronic document library for filing common documents	Ongoing/In Progress			The School of Construction and Environment piloted this initiative. There are 25 documents stored.	The plan is to expand this to all departments.	2009	No End Date (Continuous)
Post materials online that were previously printed	Ongoing/In Progress			This has been common practice at BCIT, since it has a large IT academic school and department.	Continue this practice.	2005	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
Switch to an electronic payroll notification system in place of paper pay stubs	Complete			This has been common practice at BCIT.		2005	No End Date (Continuous)
<b>Behaviour change program</b>							
Train staff to use collaborative software for electronic editing (e.g. SharePoint, Groove, etc.)	Ongoing/In Progress	100	% of staff currently have received collaborative software training	This has been common practice at BCIT.	continue to train new staff with this type of collaborative editing process.	2005	No End Date (Continuous)
Encourage staff to hold paperless meetings or presentations (i.e., no handouts)	Ongoing/In Progress			The "Get Print Smart" campaign ran from October 15 to December 15 2009. The goal was to have staff reduce paper/printing by 20% for all campuses.	This initiative will continue with the other campaigns to reduce energy consumption.	2009	No End Date (Continuous)

## BCIT - 2009 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 12/31/09)	Performance to Date (as of 12/31/09)	Steps Taken in 2009	Steps Planned for 2010 -2012	Start Year	End Year
<b>Business Travel</b>						
<b>Policy and budgeting</b>						
Create a low-carbon travel policy or travel reduction goal	Ongoing/In Progress		BCIT implemented a moratorium on out-of-Province travel for business for all administrative and management employees.	BCIT will continue moratorium on out-of-Province travel for business.	2009	No End Date (Continuous)
<b>Virtual meeting technology</b>						
Make desktop web-cameras available to staff	Complete	80 % of staff have access to a desktop web-camera	New computers that were issued to staff in 2009 all have web-cameras. This practice will as staff trade in their older computers.		2009	No End Date (Continuous)
<b>Behaviour change program</b>						
Encourage carpooling to meetings	In Development			Car pooling is encouraged there are no preferred parking spots for car pooling employees.	2009	No End Date (Continuous)
Encourage alternative travel to meetings (e.g., bicycles, public transit, walking)	In Development			Identifying improved Transit opportunities and the discussion with Translink on the possibility of incorporating a U-Pass program for the campus.	2008	No End Date (Continuous)
<b>Education, Awareness, and Engagement</b>						
<b>Team-building</b>						
Create Green, Sustainability, Energy Conservation, or Climate Action Teams with executive endorsement	In Development		A volunteer committee was organized called Environmental Stewardship and Sustainability Practices (ESSP). BCIT's management were invited to form this committee.	The ESSP committee was no longer voluntary and now a formal committee with executive support	2008	No End Date (Continuous)
Provide resources and/or dedicated staff to support teams	Ongoing/In Progress		Round table discussion for green revolving fund to support green initiatives.	Present green revolving fund to support environmental initiative on campus to upper management at BCIT. Create fund.	2009	2012
Providing behaviour change education/training to teams (e.g., community-based social marketing)	In Development			Planned campaign for turning off the lights will use community based social marketing techniques.	2010	2011
<b>Awards/Recognition</b>						
Establish a sustainability/green awards or recognition program	Ongoing/In Progress		Earth Apple award has been recognizing BCIT employees who contribute toward environmental initiatives since 1998.	Continue to annually recognize employees who provide outstanding service to the environment at BCIT	1998	No End Date (Continuous)
<b>Staff Professional Development</b>						
Support green professional development (e.g., workshops, conferences, training)	Ongoing/In Progress		Since 2008 the Pacific Spirit Project enables faculty who are interested in incorporating sustainability concepts and practices into their curriculum.	Contine the Pacific Spirit Project.	2008	2012
Include green options in employee performance measurement system	In Development			Based on BCIT's 2010/2011 implementation plan there are stipulations with a number of green initiatives, which management will be evaluated on.	2010	2011
<b>Staff awareness/education</b>						

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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 education to staff about the science of climate change	Ongoing/In Progress			Peter Robinson came to speak to BCIT staff and students on Climate Change. He also met separately with Senior management during the day.	Continue to provide educational opportunities for learning about climate change.	2009	No End Date (Continuous)
Provide education to staff about the conservation of water, energy, and raw materials	Ongoing/In Progress	350	Number of people exposed to education material	The Energy manager delivered many presentation to different departments with BCIT on conservation.	Continue awarens education for staff and students.	2009	No End Date (Continuous)
<b>Other Sustainability Actions</b>							
<b>Water conservation</b>							
Introduce a stormwater management landscape strategy (e.g., vegetated roofs, permeable paving, rain gardens, bioswales)	Ongoing/In Progress			BCIT has been conducting green roof and living wall research since 2003. There is one green roof on the Burnaby campus and two green roofs on the Great Northern Way campus. Green screens were installed on the Great Northern Way campus. An assesment was conducted on the Burnaby campus to determine which existing roofs could have a green roof.	Implement green roofs on the Burnaby campus.	2003	No End Date (Continuous)
<b>Waste reduction/diversion</b>							
Put in place an operations policy to facilitate the reduction and diversion of building occupant waste from landfills or incineration facilities	Ongoing/In Progress			An waste audit was conducted in 2002/2003, for the Burnaby campus. Since then every year measues have been taken to reduce waste. In 2009, Smaller waste bins were introduced to employees on the Burnaby campus.	Procedures will be created to support all campuses with smaller bins.	2003	No End Date (Continuous)
Implement a hazardous waste reduction and disposal strategy	In Development				Create an education campaign for improved reporting and documentation of hazardous waste on campus.	2011	No End Date (Continuous)
<b>Procurement (non-paper supplies)</b>							
Implement sustainable purchasing program for cleaning products, disposable paper products and trash bags	Complete			As of early 2009, all BCIT campuses began using environmentally friendly cleaning products exclusively. BCIT and Compass Group, which provides BCIT's janitorial and food services, were jointly awarded EcoLogo's Environmental Stewardship Award for our Green Chemicals Program.		2008	2009
Require a minimum purchase of sustainable, and organic food and beverages supplied by contracted food suppliers or caterers	Ongoing/In Progress	25	% of the combined total food and beverage purchase (in cost) meets these requirements	Chartwells group which provides the food service for BCIT, began to introduce local organic options.	Chartwells continues to plan to provide organic food options when possible. Community gardens on the Burnaby campus are being planned	2009	No End Date (Continuous)
<b>Commuting to and from home</b>							
Encourage commuting by foot, bicycle, carpool or public transit	Ongoing/In Progress			Every year bike to work week is an initiative that is conducted on the Burnaby Campus.	Identifying improved Transit opportunities and the discussion with Translink on the possibility of incorporating a U-Pass program for the campus.	2006	No End Date (Continuous)
Provide shower or locker facilities for staff/students who commute by foot or by bicycle	Complete			BCIT has had showers and lockers in for staff in the Gym and most buildings.		1990	2009
Modify parking fees or parking availability for staff/students	Ongoing/In Progress			The implementation of the employee taxable benefit has resulted in sixty-five employees cancelling their parking privileges.	Continue to modify parking fees to encourage car pooling and alternative modes of transportation.	2009	No End Date (Continuous)
<b>Other Sustainability Actions</b>							
Presentation of ecological footprint of the Burnaby campus was conducted in a few forms of outreach.	Complete			The results of the ecological footprint which was conducted for the Burnaby campus was published.		2007	2009