

College of New Caledonia – 2010 Carbon Neutral Action Report

Executive Summary

Several initiatives related to energy reduction in 2010 met with success, as evidenced by the College being able to reduce overall energy consumption by 4%. A culture of energy conservation is being included in policies and procedures which will help us achieve our goal of 7% electricity and 32% natural gas reduction by the year 2013. Focus for the upcoming year includes: Policy development, targets and reporting, plans and actions, teams and committees, and employee awareness/training.

Penny Fahlman, Vice President Finance and Administration

Overviews

Actions taken to reduce greenhouse gas emissions in 2010

- Late in December 2010, a lighting retrofit project was initiated that will see inefficient T12 fluorescent lighting in approximately 15 classrooms upgraded to occupancy-controlled, energy-efficient, T8 fluorescent lighting. The retrofit – scheduled for completion during the first quarter of FY2011 – is expected to save over 92,000 kWh/year (\$6,150/year) in consumption and up to 330 kW/year (\$2,650/year) in demand. Valued at approximately \$60,000, the project is co-funded by CNC, BC Hydro, and Natural Resources Canada.
- The cafeteria servery was renovated during the summer of 2010. The renovation included an energy efficient lighting retrofit and an Energy Star dishwasher upgrade.
- From May until August 2010, the Main Campus gymnasium was closed for use: the air handling unit was shut down, lighting turned off, and the hot water boiler temporarily taken out of service. This initiative saved an estimated 78,000 kWh (\$3,100) over the four-month period and is expected to be repeated to some degree in FY2011.

Most of the common areas on the Prince George Main Campus are lit by manually-controlled, inefficient T12 fluorescent lighting. This common area lighting burned virtually 24 hours per day, 365 days per year until late June 2010 at which time a daily manual common area lighting shut-down procedure was put in place. Since that time, Security staff manually turns off switchable common area lighting in areas with good day lighting during the day and in all switchable common areas each evening as activity in the building wanes (usually between 9:00 PM and 10:00PM on weekdays; earlier on weekends). This ongoing initiative is expected to save approximately 84,000 kWh/year (\$5,600/year).

During July and August 2010 access was restricted to computer labs and classrooms that were not scheduled for Intersession classes. Lights and electronic equipment were turned off, thermostat settings were increased (to avoid unnecessary cooling), blinds were drawn (to minimize solar gain), and doors were locked. This initiative saved an estimated 35,400 kWh (\$1,400) over the two-month period and is expected to be repeated in FY2011.

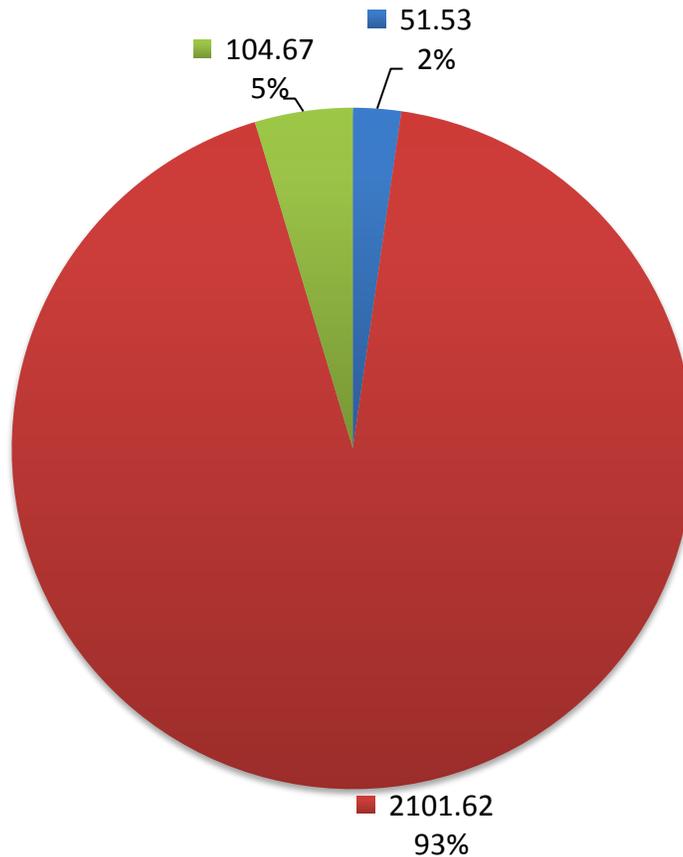
- In September 2010, the Brink Building was accepted into BC Hydro's Continuous Optimization program. Enersolv Design + Build Ltd. (Vancouver) began its work as Service Provider in December 2010 and conducted a site visit in January 2011. CNC is currently reviewing Enersolv's first project deliverable: Investigation Progress Report. In executing the BC Hydro Continuous Optimization Agreement, CNC has committed to implementing energy efficiency upgrades as identified by Enersolv and with a simple payback of less than two years up to a total value of \$15,000.
- CNC began reviewing and amending as necessary current procurement policies and procedures. This included developing RFP language to ensure that long-term energy consumption was considered in the designs of Medical Radiography and classroom lighting retrofit projects. This work will continue to evolve in FY2011 and will include formalizing already existing practices of purchasing energy efficient equipment (e.g. Energy Star purchasing policy).
- Work was initiated with the Human Resources department to identify jobs within the College with strong links to energy consumption. In FY2011 this work will continue to include energy conservation language and expectations into the job descriptions and performance evaluation criteria for these positions.
- Communicating Energy Management Programmed targets, objectives, and achievements to all levels of the organization is important to raise energy conservation awareness and gain buy-in from all stakeholders. In FY2010 formal communication was generally limited to the Energy Executive in Quarterly BC Hydro Presentations. Presentations on a more *ad hoc* basis were also given to Regional Managers and Prince George Operations staff. With CNC's recent commitment to allocate funding toward energy efficiency projects, new energy efficiency projects will kick off early in FY2011. This will provide an opportunity to formally roll out the Energy Management Program to all stakeholders: faculty, staff, students, and the community. This will involve completing communications and reporting work that began in FY2010 including developing an Energy Management page on CNC's website, scheduling quarterly Operations meetings and semi-annual Regional Management presentations.
- CNC's Information Technology department completed two projects in FY2010 that will incur ongoing electricity savings: 54 servers were virtualized with expected savings of 90,000 kWh/year (\$6,000/year) and 60 Power Save software licenses were installed with expected savings of 10,000 kWh/year (\$700/year).

Plans to reduce greenhouse gas emissions in 2011

- In January 2011, CNC received 100% provincial government funding approval under a Public Sector Energy Conservation Agreement (PSECA) for a solar water heating system that will be installed on the Student Residence. The system will supplement the Residence's domestic hot water system and is expected to displace 202 GJ/year natural gas (\$2,500 including avoided carbon emissions offset payments). The system will demonstrate CNC's leadership in supporting clean, renewable energy sources and will provide Trades Programmed educational opportunities. The system will be operational by the end of August 2011.

- The Energy Management program will be extended to CNC regional campuses in 2011. Energy reduction projects will be identified and prioritized for action.
- CNC's Main Campus library is illuminated with more than 400, 2-lamp T8 fluorescent fixtures. Ballasts in these fixtures are not well-suited to the application and as a result, lamps have prematurely failed since the system was installed. Suitable replacement ballasts have been identified and CNC will conduct a pilot test to evaluate light output using these ballasts with 28W long life and 28W extra-long life lamps. If the test is successful, CNC will begin replacing the existing ballasts with the new ballasts and the lower wattage lamps as lamps currently in place fail. Once completely retrofitted, the new system is expected to save almost 47,000 kWh/year in consumption (\$3,100 /year) and up to 9.3 kW in demand (\$900/year). The longer-life lamps will also result in significant labour savings associated with lamp replacement.
- In September 2011, CNC will begin offering a Medical Radiography (Med Rad) program. Two existing rooms (3-221 and 3-224) in 200 Block are currently being renovated for this purpose. Recognizing that X-ray equipment associated with the program will increase Main Campus electricity consumption and demand, during the service procurement process CNC required that energy efficiency be built into the design for Med Rad mechanical and lighting systems. An energy-efficient HVAC unit will be installed with variable speed controls and an air-side economizer that will allow the system to operate in free cooling mode. Design simulations show that equipping the unit with an economizer will mean that it will operate in free cooling mode to deliver the vast majority of space cooling demand. Mechanical cooling will be required for only a very small percentage of the time. Inefficient T12 fluorescent lighting in the area will be upgraded to occupancy-controlled, dimmable, energy-efficient T8 fluorescents. Annual lighting savings for this retrofit are estimated at approximately \$350 in consumption (5,300 kWh/year) and up to \$180 in demand (1.8 kW).

College of New Caledonia Greenhouse Gas Emissions by Source for the 2010 Calendar Year (tCO₂e*)



Total Emissions: 2257.82

- 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: **2256.3**. Total offset investment: **\$56,407.50**. Emissions which do not require offsets: **1.52** **

*Tonnes of carbon dioxide equivalent (tCO₂e) is a standard unit of measure in which all types of greenhouse gases are expressed based on their global warming potential relative to carbon dioxide.

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

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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 12/31/10)	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)							
Vehicle fuel efficiency							
Replace vehicles with more fuel-efficient models	Ongoing/In Progress		Fuel consumption is part of the new vehicle procurement evaluation criteria.	Continue practice.	Started before 1995	No End Date (Continuous)	
Replace larger vehicles with smaller models according to fleet "right-sizing" principles	Ongoing/In Progress		Vehicle right-sizing is part of the new vehicle procurement evaluation criteria.	Continue practice.	Started before 1995	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	Entire fleet is subject to weekly maintenance checks and scheduled maintenance based on vehicle mileage.	Continue practice.	Started before 1995	No End Date (Continuous)
Replace small maintenance vehicles with more fuel-efficient models	Ongoing/In Progress		Fuel consumption is part of the new vehicle procurement evaluation criteria.	Continue practice.	Started before 1995	No End Date (Continuous)	
Behaviour change program							
Introduce anti-idling policy and/or raise anti-idling awareness for fleet drivers (e.g., signs, stickers, messages)	Ongoing/In Progress		Communications issued for drivers at CNC to observe anti-idling behavior. Anti-idling signs posted at Prince George Campus.	Continue to promote anti-idling program through various venues.	2009	No End Date (Continuous)	
Encourage carpooling in fleet vehicles	Ongoing/In Progress		Carpooling in fleet vehicles is encouraged/practiced as an informal policy.	Continue to target carpooling in fleet vehicles as part of awareness program.	2009	No End Date (Continuous)	
Promote alternatives to fleet vehicle travel where possible (e.g., bicycles, public transit, walking)	Ongoing/In Progress		Secure bicycle storage available + carpooling encouraged.	Maintain secure storage area + continue to encourage carpooling.	Started before 1995	No End Date (Continuous)	
Stationary Fuel Combustion, Electricity and Fugitive Emissions (Buildings)							
Planning/management							
Enrol in a building energy benchmarking program (e.g., GREEN UP)	Ongoing/In Progress		New Quesnel Trades and Education Centre and Prince George Trades and Education Centre buildings have been constructed to LEED standards.	As funding permits CNC will continue to explore these kinds of opportunities.	2005	No End Date (Continuous)	
Reduce office space (square meters) per employee	Ongoing/In Progress		Implemented during Brink Building renovation + with new QTEC and PGTEC Buildings.	Preliminary planning on centralizing office space for year round employees/departments.	2011	No End Date (Continuous)	
Install a real time metering system (e.g. Pulse, Reliable Controls, Houle Controls)	Ongoing/In Progress		Brink Building is currently in BC Hydro Continuous Optimization program, metering is being installed.	Add additional buildings as funding permits.	2009	No End Date (Continuous)	
Owned buildings							
Establish energy performance baseline for owned buildings	Completed in 2010		All buildings now complete.	Continue practice.	2008	No End Date (Continuous)	
Achieve LEED NC Gold certification at a minimum for new construction or major renovations	Ongoing/In Progress		All new buildings are constructed to LEED standards.	Continue practice.	2010	No End Date (Continuous)	
Complete energy retrofits on existing, owned buildings	Ongoing/In Progress		Various energy reduction projects in the works and completed, see introduction comments for more detailed information.	Continue practice.	Started before 1995	No End Date (Continuous)	

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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
Retrofitting owned buildings							
Upgrade mechanical systems (heating, cooling, ventilation) during retrofits	Ongoing/In Progress			New PTAC units installed at the Student Residence building + an energy efficient hot water heater. Funding approved to install solar panels at the Student Residence building to preheat domestic hot water.	High efficient RTU's added to our Medical Radiography area and Nicholson campus. Planned upgrades to central plant with high efficiency boilers and energy efficient chillers.	Started before 1995	No End Date (Continuous)
Upgrade lighting systems during retrofits	Ongoing/In Progress			Various classroom and office areas upgraded as renovations occur.	Major upgrade to various classrooms from T12 to T8 fixtures with photocells and occupancy sensors.	Started before 1995	No End Date (Continuous)
Upgrade/adjust control systems during retrofits	Ongoing/In Progress			Upgrades have been identified and will be complete as funding permits.	Continue practice.	Started before 1995	No End Date (Continuous)
Improve building insulation (including windows) during retrofits	Ongoing/In Progress			Damaged insullation on domestic water lines repaired in various mechanical rooms.	Continue practice.	Started before 1995	No End Date (Continuous)
Leased buildings							
Establish energy performance baseline for leased buildings	Completed in 2010			Information has been compiled and performance monitored.	Continue practice.	2010	No End Date (Continuous)
IT power management							
Install power management software which shuts down computers outside of regular business hours	Ongoing/In Progress	65	% of computers shut down automatically outside of regular business hours	Project progressing.	Continue to work on project.	2009	No End Date (Continuous)
Implement server virtualization	Ongoing/In Progress	80	% of servers have been virtualized since start year indicated	Project progressing.	Scheduled to complete in 2011	2009	2011
Apply auto-sleep settings on computer monitors and CPUs	Ongoing/In Progress			Continue to apply setting to new equipment.	Continue practice.	2009	No End Date (Continuous)
Remove stand-alone printers, copiers, and/or fax machines and install multi-function devices	Ongoing/In Progress			Continually reviewed and devices removed as funding permits.	Continue practice.	2009	No End Date (Continuous)
Apply auto-sleep settings on printers, copiers, fax machines, and/or multi-function devices	Ongoing/In Progress			Adopted practice for existing and new equipment.	Continue practice.	2009	No End Date (Continuous)
Replace computers with ENERGY STAR models during regular computer upgrades	Ongoing/In Progress	80	% of computers are ENERGY STAR rated	Adopted practice.	Continue practice.	2009	No End Date (Continuous)
Appliances and electronic devices							
Replace refrigerators with ENERGY STAR models or source ENERGY STAR models for future purchases	Ongoing/In Progress			Purchasing energy star refrigerators continues to be CNC's practice.	Draft formal policy.	Started before 1995	2011
Replace other appliances or electronic devices with ENERGY STAR models or source ENERGY STAR models for future purchases	Ongoing/In Progress			Purchasing other appliances with energy star models continues to be CNC's practice.	Draft formal policy.	Started before 1995	2011
Behaviour change program							
Ask staff to unplug electrical equipment or switch off power bars when not in use	Ongoing/In Progress			Periodic reminders to staff/students to reduce electricity by turning items off when not in use.	Continue to provide reminders.	2009	No End Date (Continuous)
Ask staff to close blinds at end of work day to reduce heating/cooling demands	Ongoing/In Progress			Periodic reminders to staff to close blinds.	Continue practice.	2009	No End Date (Continuous)

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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
Provide tips to staff on saving energy in the office while working outside of regular business hours	Ongoing/In Progress		Periodic suggestions/reminders to staff on how to reduce/save energy.	Continue practice.	2009	No End Date (Continuous)
Encourage use of stairs instead of elevators	In Development			Post signs encouraging staff to use stairs over elevators for health benefits and to reduce energy.	2011	No End Date (Continuous)
Provide reminders for turning off lights (e.g., signs, stickers, messages)	Ongoing/In Progress		Various emails, signs, and posters throughout building encourage this practice.	Updates signs.	2009	No End Date (Continuous)
Promote hot water conservation	Ongoing/In Progress		Shut down large boiler that services gymnasium area during low activity summer months.	Contemplating the installation of small hot water tanks to service areas with reduced usage over holiday/break periods.	2011	No End Date (Continuous)
Supplies (Paper)						
Paper Type						
Purchase 30% post-consumer recycled paper	Ongoing/In Progress		Continuing to develop paper purchasing strategy.	Develop paper purchasing strategy.	2008	No End Date (Continuous)
Purchase 100% post-consumer recycled paper	Ongoing/In Progress		Continuing to develop paper purchasing strategy.	Develop paper purchasing strategy.	2008	No End Date (Continuous)
Printer/document settings						
Apply "print and hold" settings to networked printers to eliminate unclaimed print jobs	Ongoing/In Progress		Evaluation complete in 2010.	Complete implementation by summer 2011.	2010	No End Date (Continuous)
Electronic media in place of paper						
Install collaborative software for electronic editing (e.g. SharePoint, Groove, etc.)	Ongoing/In Progress		Evaluating software options.	Install selected software.	2009	No End Date (Continuous)
Post materials online that were previously printed	Ongoing/In Progress		Continue practice.	Continue practice.	Started before 1995	No End Date (Continuous)
Switch to an electronic payroll notification system in place of paper pay stubs	Completed in 2010		New process adopted in 2010, all payroll information is now electronic.		2010	No End Date (Continuous)
Behaviour change program						
Train staff to use collaborative software for electronic editing (e.g. SharePoint, Groove, etc.)	In Development			Will be considered pending results of software evaluation.	2010	No End Date (Continuous)
Encourage staff to hold paperless meetings or presentations (i.e., no handouts)	Ongoing/In Progress		New table installed in Board Room fit with outlets for laptops and ethernet connections for paperless meetings.	Continue to encourage practice throughout institution.	2009	No End Date (Continuous)
Encourage re-use of scrap paper	Ongoing/In Progress		No new steps taken.	Continue to encourage practice throughout institution.	Started before 1995	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 12/31/10)	Performance to Date (as of 12/31/10)	Steps Taken in 2010	Steps Planned for 2011 -2013	Start Year	End Year
Business Travel						
Virtual meeting technology						
Install web-conferencing software (e.g., Live Meeting, Elluminate, etc.)	In Development			Currently being evaluated.	2011	No End Date (Continuous)
Make desktop web-cameras available to staff	Ongoing/In Progress		Web cams are available for staff that utilize them.	Continue practice.	2008	No End Date (Continuous)
Install video-conferencing units in meeting rooms or provide mobile video-conferencing units	Ongoing/In Progress		Installed in various areas of the College.	Continue practice.	2009	No End Date (Continuous)
Behaviour change program						
Train staff in web-conferencing	Ongoing/In Progress		Training conducted on an as-required basis.	Continue training on an as-required basis.	2008	No End Date (Continuous)
Train staff in video-conferencing or provide technical support for video-conferencing set-up	Ongoing/In Progress		Training conducted on an as-required basis.	Continue training on an as-required basis.	2009	No End Date (Continuous)
Encourage staff to consider virtual attendance/presentation at events where possible	Ongoing/In Progress		Practice continues to be encouraged.	Continue practice.	2009	No End Date (Continuous)
Encourage carpooling to meetings	Ongoing/In Progress		Practice continues to be encouraged.	Continue practice.	Started before 1995	No End Date (Continuous)
Encourage alternative travel to meetings (e.g., bicycles, public transit, walking)	Ongoing/In Progress		Practice continues to be encouraged.	Continue practice.	Started before 1995	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		Green Team formed in 2009 but has since become inactive, due to key individuals leaving employment with CNC.	Re-establish team and goals.	2011	No End Date (Continuous)
Provide resources and/or dedicated staff to support teams	Ongoing/In Progress		Meetings scheduled but low attendance.	Executive group to provide resources and dedicated members.	2011	No End Date (Continuous)
Providing behaviour change education/training to teams (e.g., community-based social marketing)	Ongoing/In Progress		Information presented at open houses and other events.	Continue practice.	2009	No End Date (Continuous)
Staff Professional Development						
Support green professional development (e.g., workshops, conferences, training)	Ongoing/In Progress		Attendance at work shops for individuals involved in energy reduction strategies.	Promote attendance at events.	2009	No End Date (Continuous)
Staff awareness/education						
Provide education to staff about the science of climate change	Ongoing/In Progress		Information has been provided through various forums (email, library displays, etc.)	Continue practice.	2009	No End Date (Continuous)

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Provide education to staff about the conservation of water, energy, and raw materials	Ongoing/In Progress		Information has been provided through various forums (email, library displays, etc.)	Continue practice.	2009	No End Date (Continuous)
Provide green tips on staff website or in newsletters	Ongoing/In Progress		Information has been provided through various forums (email, library displays, etc.)	Continue practice.	2009	No End Date (Continuous)
Client/public awareness/education						
Provide education to clients/public about the science of climate change	Ongoing/In Progress		Information has been provided through various forums (email, library displays, etc.)	Continue practice.	2009	No End Date (Continuous)
Provide education to clients/public about the conservation of water, energy, and raw materials	Ongoing/In Progress		Information has been provided through various forums (email, library displays, etc.)	Continue practice.	2009	No End Date (Continuous)
Provide green tips on client/public website or in newsletters	Ongoing/In Progress		Information has been provided through various forums (email, library displays, etc.)	Continue practice.	2009	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		Efficient models installed when replaced or renovated.	Continue practice.	2005	No End Date (Continuous)
Introduce a stormwater management landscape strategy (e.g., vegetated roofs, permeable paving, rain gardens, bioswales)	Ongoing/In Progress		Vegetated roof is a design aspect of the new PGTEC building.	Continue to explore various opportunities.	2009	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		No bottled water policy in development along with recycling program for cardboard, paper, and bottle, cans, etc.	Continue practices.	2000	No End Date (Continuous)
Implement a hazardous waste reduction and disposal strategy	Ongoing/In Progress		Fluorescent lamp 'Bulb Eater' purchased for proper disposal of old light tubes. Paints and solvents are taken to appropriate recycle stations.	Continue practice.	2010	No End Date (Continuous)
Procurement (non-paper supplies)						
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			Formal policy to be developed and adopted.	2011	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		Low value items are taken to second hand stores for reuse and items of value are taken to asset recovery center for auction.	Continue practice.	2005	No End Date (Continuous)
Incorporate lifecycle costing into new construction or renovations	In Development			Continue practice.	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			Develop policy.	2011	No End Date (Continuous)
Commuting to and from home						

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Encourage commuting by foot, bicycle, carpool or public transit	Ongoing/In Progress		Practice encouraged through various forums.	Continue practice.	2009	No End Date (Continuous)