



School District 68 (Nanaimo-Ladysmith) - 2010 Carbon Neutral Action Report

Executive Summary

In 2010, School District 68 (Nanaimo-Ladysmith) continued with a number of energy reduction activities that had previously been initiated and also introduced some new projects.

Lighting retrofits continued to be the focus of energy efficiency related projects with these projects expanded in 2010 to include in-house design. This allows for a more exacting design to conform to the most energy efficient configuration and to best fit with the district's maintenance requirements. New major energy-reduction projects included a boiler upgrade at an elementary school, a solar photovoltaic array coming on line and the start of solar hot water installations at three schools.

Field irrigation controls are now resulting in water savings of about 14% per site with further savings to be realized as the system is expanded to additional sites.

Fleet vehicle renewal continued with the replacement of seven existing vehicles with more fuel efficient models. The installation of GPS units on bus and fleet vehicles for tracking and database collection purposes was completed during the year. GPS tracking allows for closer monitoring especially with regard to idling. This will support the anti-idling policy that is in the second stage of review for final approval in 2011.

Changes in purchasing practices have resulted in sustainable cleaning equipment and cleaning products used by custodial staff throughout the district being 100% green. This includes eco-friendly pumice hand cleaner used in school shops. The total number of cleaning products has been reduced to five. Purchasing standards include items such as double glazed window units that were incorporated into portable building upgrades.

Energy Star computer equipment became a standard purchasing practice in 2010, along with a server and work station reduction program. A paperless classroom pilot project by the Information Systems department was also begun with measured results available early in 2011.

The development of an energy and sustainable website was completed with an expected rollout early in 2011. In 2010, the district hired a full time Energy Manager.

2010 Greenhouse Gas Emissions

The total annual Greenhouse Gas Emissions from all sources covered by the Greenhouse Gas Reduction Targets Act was 4,456 tCO₂e

Offsets Applied to Become Carbon Neutral in 2010

The total emission offsets applied to become carbon neutral is 3,912 tCO₂e

Emissions of 544 tCO₂e resulting from the operation of school buses were not offset as they are out-of-scope under Section 4(2)(c) of the Carbon Neutral Government Regulation but were reported as part of the greenhouse gas emissions profile of 2010 as required by Section 5 of the regulation.

Actions Taken to Reduce Greenhouse Gas Emissions in 2010

The main HVAC upgrade was the installation of a condensing boiler in an elementary school. This condensing boiler has the capability of reaching a conventional boiler's upper temperature range therefore eliminating the need for a conventional/condensing boiler hybrid system. This will now be the standard design for all future condensing boiler installations.

A five school lighting retrofit/upgrade project was completed as part of the process of eliminating older inefficient lighting technology. This year, the district changed to bring lighting design in-house. BY incorporating its own lighting retrofit design standard, the district was able to achieve increased lighting and user comfort levels and maximize the reduction in energy use while easing the burden on maintenance staff.

The profile of solar power received a huge boost this year with a photo voltaic project coming on line and the start of the installation of solar hot water systems at three secondary schools. These became operational early in 2011. Real time data from these systems is available via the district website, giving the schools and the general public the ability to participate in the solar educational experience.

A cooperative process between the energy manager's office and the maintenance department to monitor trends and identify out-of-tolerance conditions was introduced this year. This allows for corrective action to be taken quickly, further reducing the waste of energy caused by fault conditions. This quicker action and consistency is now possible with the presence of a full time energy manager team.

Plans to Continue Reducing Greenhouse Gas Emissions 2011 – 2013

The goal of behaviour change will receive increased emphasis, with the expansion of the student energy and environmental programs scheduled for early 2011. These programs will be completed by the end of the school year in June with the resumption of programs starting in September.

Re-commissioning of larger facilities' HVAC systems will take place in 2011 with applications for re-commissioning scheduled for submission in early 2011. The focus will be on the calibration of the entire HVAC system's equipment and controls and the revision of control strategies for fan run time reduction during regular school hours and lighting level reduction in unoccupied areas such as corridors.

Server virtualization will continue to be an on-going process for the foreseeable future.

The investigation of the feasibility of geo-exchange systems will continue into 2011, with two sites being investigated for possible partnership with other community organizations. In addition to the savings that would come from such a system, these systems would be an educational showcase for schools and the community..

The goal for the newly developed website dedicated to sustainability and energy conservation is to showcase the achievements and activity of students with the expectation that these actions will extend into student's homes.

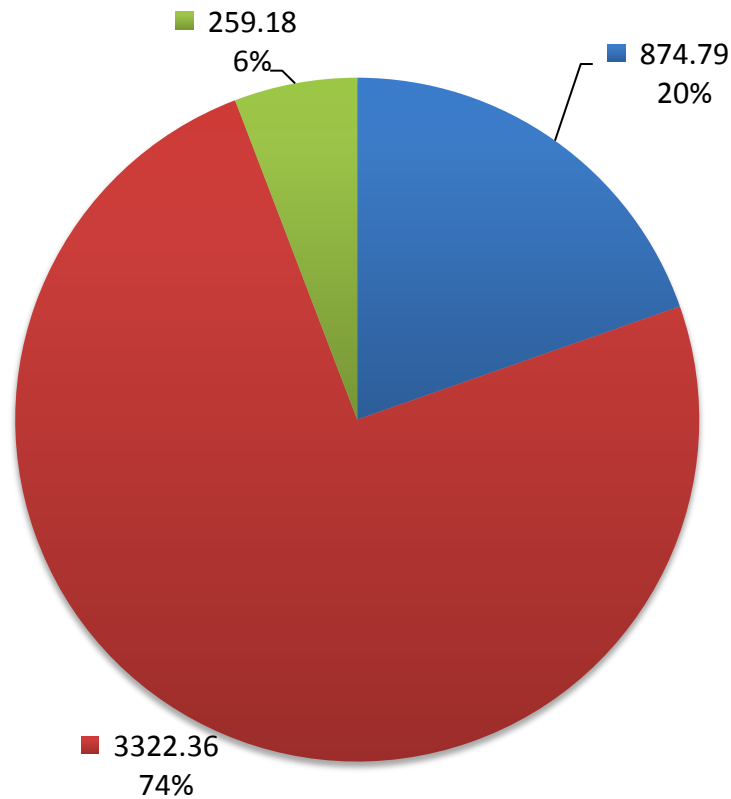


Phil Turin, Secretary-Treasurer

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Greenhouse Gas Emissions by Source for the 2010 Calendar Year (tCO₂e*)



Total Emissions: 4456.33

- 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: **3912.19**. Total offset investment: **\$97,804.75**. Emissions which do not require offsets: **544.14** **

*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	8	% of vehicles are fuel- efficient models	Vehicle replacement	Standard purchasing practice	2009	No End Date (Continuous)
Perform regular fleet maintenance to improve fuel-efficiency	Ongoing/In Progress	2	% of vehicles are subject to regular maintenance for fuel efficiency	Idle time limit programmed into 2 Wheelchair capable buses	All new buses to get same programming	2007	No End Date (Continuous)
Behaviour change program							
Provide fleet driver training to reduce fuel use	Completed in 2010	100	% of current drivers are trained	Remaining drivers received training	Training will be standard for future drivers during orientation	2010	No End Date (Continuous)
Introduce anti-idling policy and/or raise anti-idling awareness for fleet drivers (e.g., signs, stickers, messages)	Ongoing/In Progress			Anti-Idling policy in phase II review	Introduction of policy changes. Raise anti-idling awareness through the use of GPS monitoring of all vehicles	2010	2011
Other Mobile Fuel Combustion Actions							
GPS units in all vehicles	Completed in 2010			GPS units installed in all vehicles and monitoring begun	Baseline data and awareness campaign to be established	2010	No End Date (Continuous)
Programming buses for more efficiency by a 6th override gear, change from performance to economy mode for acceleration and limiting idle time	Ongoing/In Progress			Programming to remaining 9 buses complete	All new buses include this feature as standard	2010	2011
Crankcase Ventilation Kits	Ongoing/In Progress	100	% complete	All buses now have kits installed	Already an option on all new buses	2009	2011
All diesel fuel at 5% bio	Completed in 2010	100	% of all diesel vehicles	Switch over to 5% bio-diesel blend	Monitor on-going performance especially during colder periods	2010	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)	In Development			BEPI Established - baseline year 2009. Export sheets to conform to SMARTTTool requirements	Monthly reports of on-going performance	2010	No End Date (Continuous)
Install a real time metering system (e.g. Pulse, Reliable Controls, Houle Controls)	Ongoing/In Progress	0	% of buildings have a real time metering system installed	Established funding process based on previous energy savings	2011: 2 schools to enter Continuous Optimization program 2012: Possible next 2 schools for C-Op program	2010	2013
Owned buildings							
Establish energy performance baseline for owned buildings	Completed in 2010	100	% of owned buildings have an established energy performance baseline	Baseline year established (2009)	Establish reduction targets	2010	2011

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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
Incorporate a refrigerant management strategy into regular building management/maintenance to reduce fugitive emissions	Ongoing/In Progress			Continued standard practice	Continuance of standard practice	2003	No End Date (Continuous)
Complete energy retrofits on existing, owned buildings	Ongoing/In Progress	11	% of owned buildings have undergone energy retrofits since start year indicated	Lighting and HVAC retrofit projects completed	Lighting retrofit and HVAC Upgrade projects	2005	No End Date (Continuous)
Retrofitting owned buildings							
Upgrade mechanical systems (heating, cooling, ventilation) during retrofits	Completed in 2010	100	% of retrofits since start year indicated had heating, cooling, and ventilation systems upgrades	One elementary school boiler system upgraded to condensing	Upgrades depend on funding availablilty	2010	2010
Upgrade lighting systems during retrofits	Completed in 2010	100	% of retrofits since start year indicated had lighting systems upgrades	Five facilities completed	2011: Four schools scheduled	2010	2011
Upgrade/adjust control systems during retrofits	Completed in 2010	100	% of retrofits since start year indicated had control system upgrades or adjustments	Boiler control strategy changes	2011: Control strategies for C-Op projects	2011	2013
Improve building insulation (including windows) during retrofits	Completed in 2010	100	% of retrofits since start year indicated had insulation improvements	Portable window replacements to double glazing	Continuous practice	2010	No End Date (Continuous)
Install an on-site renewable energy demonstration project	Ongoing/In Progress	100	% of retrofits since start year indicated had on-site renewable energy components	Solar Hot water projects to three secondary schools started	2011: Complete solar hot water projects and on-line	2010	2011
IT power management							
Install power management software which shuts down computers outside of regular business hours	Completed in 2010	100	% of computers shut down automatically outside of regular business hours	Software installed on new computers	Continuous practice	2007	No End Date (Continuous)
Implement server virtualization	Ongoing/In Progress	2	% of servers have been virtualized since start year indicated	4 - 1 reduction	Continuous practice	2008	2013
Apply auto-sleep settings on computer monitors and CPUs	Completed in 2010	100	% of computers have auto-sleep settings applied	Continuous practice for all new units	Continuous practice	2005	No End Date (Continuous)
Apply auto-sleep settings on printers, copiers, fax machines, and/or multi-function devices	Completed in 2010	100	% of devices have auto-sleep settings applied	New copier fleet have this function activated	Investigate fuction for other devices	2010	2012
Replace computers with ENERGY STAR models during regular computer upgrades	Ongoing/In Progress	100	% of computers are ENERGY STAR rated	Continuous practice for all new units. One school replaced 300 monitors to LCD from Eco Clib competition winnings	Continuous practice	2008	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			Standard practice	Continuous practice	2005	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
Replace other appliances or electronic devices with ENERGY STAR models or source ENERGY STAR models for future purchases	Ongoing/In Progress			Standard practice	Continuous practice	2005	No End Date (Continuous)
Behaviour change program							
Provide reminders for turning off lights (e.g., signs, stickers, messages)	Ongoing/In Progress			Stickers handed out to green team	2011: Expand program with Green Teams	2010	No End Date (Continuous)
Supplies (Paper)							
Paper Type							
Purchase 30% post-consumer recycled paper	Ongoing/In Progress	9	% of total paper purchased contains 30% recycled content	Reiteration from purchasing department to the schools as a reminder of the 30% rule whenever possible	Monitor and promote more usage	2009	No End Date (Continuous)
Purchase 100% post-consumer recycled paper	Ongoing/In Progress	1	% of total paper purchased contains 100% recycled content	Reiteration from purchasing department to the schools as a reminder of the 100% rule whenever possible	Monitor and promote more usage	2009	No End Date (Continuous)
Printer/document settings							
Switch networked printers and photocopiers to automatic double-sided	In Development	5	% of network printers or photocopiers are set to automatic double-sided	Photocopiers connected to network	Investigate double sided copy default	2010	2011
Electronic media in place of paper							
Post materials online that were previously printed	Ongoing/In Progress	2	% of schools switching over	E-newsletters now replacing hardcopies and increased use of overheads vs. paper handouts and reducing the number of printers. Also, replacing hardcopy with "teacher drives"	Promote this initiative to other schools	2010	No End Date (Continuous)
Switch to an electronic payroll notification system in place of paper pay stubs	Completed in 2010	100	% of payroll forms	T-4 Slips and re-imburements now electronic form		2010	2010

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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		Live Meeting used for few meetings/reports	Look for ways to expand	2010	2012
Behaviour change program						
Encourage carpooling to meetings	In Development		Meeting travel reviewed - no resolve to date - district too widespread	Continue to review for possibilities	2010	2011
Education, Awareness, and Engagement						
Team-building						
Create Green, Sustainability, Energy Conservation, or Climate Action Teams with executive endorsement	Ongoing/In Progress		Student teams in many schools involved in recycling, composting, box gardens, water conservation and diverting waste from local businesses. Extra seedlings from gardens taken to start gardens at home	BC Hydro student program across K-12 age groups	2010	2012
Provide resources and/or dedicated staff to support teams	Ongoing/In Progress		Full time energy manager in place Executive support in place	Expand executive support and student program Continue partnership with BC Hydro Student Programs	2010	No End Date (Continuous)
Providing behaviour change education/training to teams (e.g., community-based social marketing)	Ongoing/In Progress		Supported all student programs with technical information and backup. One school partnered with the City of Nanaimo's Greenscapes Program which removes evasive plant species. Another school involved in shore cleanup in Departure Bay and an annual neighborhood cleanup on Earth Day.	Promote the expansion of BC Hydro sponsored programs	2010	No End Date (Continuous)
Awards/Recognition						
Establish a sustainability/green awards or recognition program	In Development		Suggestions forwarded for executive review	Work toward policy	2010	2011
Staff Professional Development						
Support green professional development (e.g., workshops, conferences, training)	Ongoing/In Progress		Energy Manager and assistant continued with on-going workshops and training and regular monthly conference calls with peers	Maintain constant levels of involvement	2009	No End Date (Continuous)
Staff awareness/education						
Provide education to staff about the science of climate change	In Development		Promote alternative energy projects in district such as Photo Voltaic & Solar Hot water. One school educating staff, students and the community during class time, staff meetings and PAC meetings	Expand BC Hydro's Workplace Conservation Awareness program	2010	No End Date (Continuous)
Provide green tips on staff website or in newsletters	In Development		Sustainability Website development	2011: Website rollout - site has green tips section	2010	No End Date (Continuous)
Client/public awareness/education						
Provide green tips on client/public website or in newsletters	In Development		Sustainability Website development	2011: Website rollout - site has green tips section	2011	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
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		Continues as standard practice	To remain as standard practice	2005	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	Completed in 2010		One school teaches composting by diverting waste from local businesses and utilizing in box gardens at the school		2010	No End Date (Continuous)
Implement a hazardous waste reduction and disposal strategy	Ongoing/In Progress		Fluorescent lamps and small battery recycle program in place	To remain as standard practice	2008	No End Date (Continuous)
Procurement (non-paper supplies)						
Implement sustainable purchasing program for cleaning products, disposable paper products and trash bags	Ongoing/In Progress		Cleaning products reduced to 5 types - all green	Program continues as new products become available	2008	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		No capital Projects during this year	To be included as standard practice	2009	No End Date (Continuous)