

Carbon Neutral Action Report Delta Board of Education #37

Executive Summary

In 2008, the Delta Board of Education embraced the concept of sustainability through the adoption of a District Sustainability Policy, which set as priorities: conservation, protection, education and regulation. The Board hired a full-time dedicated Energy Manager to oversee sustainable operations with a focus on carbon neutrality, energy conservation, awareness and reporting. The opening Plenary for the 2008/09 school year had as its theme "Greening Our Schools", with guest speakers brought in to make presentations to Principals, Vice Principals, Department Heads and other management on why greenhouse gas reduction, waste reduction, conservation of water and electricity are vital to the region, the continent and the planet.

Numerous initiatives stemming from the above Board actions commenced, including "right sizing" of fleet vehicles to reduce fuel consumption and CO₂, replacement of 100 - 40% efficient gas-fired rooftop heating units with 300% efficient air source heat pumps, a feasibility study into possibly retrofitting two schools with ground source heat pumps, an energy assessment by BC Hydro to identify key tasks to reduce electrical consumption through retrofits and behavioural change.

Objectives

Conservation: adhering to the principle of conserving electricity, fossil fuels and water through an energy management program designed to optimize energy use, reduce energy consumption and source-out alternative renewable energy sources. This in turn will lead to reduced operating costs and reduction in harmful emissions into the environment while still maintaining the highest possible level of safety, comfort and health for students and staff.

Education: through educational programs, developing in its students and staff an awareness of and commitment to the concept of sustainability by establishing a leadership role in environmental stewardship, seeking to promote responsible attitudes, and fostering a holistic approach to climate change, energy utilization and waste reduction.

Protection: adopting practices that protect the environment, and in particular our students, staff and the community. Such practices in all District operations shall include, but not be limited to, substitution or elimination of the use of toxic and harmful substances, increased use of recycled and recyclable products, reduction in packaging and solid waste generation, and increased diversion of recyclable materials out of waste streams.

Regulation: meeting or exceeding requirements for public sector agencies set forth in Provincial climate action, energy conservation and other pertinent legislation, policy or regulations.

Part 1: Actions Taken to Reduce Greenhouse Gas Emissions in 2008

Overview

The Delta Board of Education embarked on a program to reduce greenhouse gas emissions, starting with its facilities. A feasibility study was completed to ascertain the most cost effective means to replace 200 antiquated gas-fired rooftop heating units at 20 schools with a more efficient, environmentally friendly heating solution. The option selected was an electric air source heat pump with natural gas backup, which is 300% efficient and calculated to reduce GHG by approximately 450 TCO₂e. Phase 1, consisting of 101 units, was completed in 2008. Initial talks with Terasen Energy Services took place to investigate the possibility of retrofitting two sites, each with 2 schools, with geo-exchange heat/hot water systems to further reduce our carbon footprint by as much as 415 TCO₂e. In addition, five gasoline-powered fleet vehicles (full-size pick-ups, vans) were retired in favour of compact, fuel efficient pickups and a hybrid SUV. Our Energy Manager visited most schools to discuss energy conservation and GHG reduction with staff, with follow-up including action plans to take place in 2009/10.

1.1 Mobile Fuel Combustion

Action	Action Taken	Outcome/Performance Measure	Notes Clarifying Action Taken
Replaced # of TYPE OF VEHICLE with MORE EFFICIENT VEHICLE/Hybrid	In progress	Reduced gasoline consumption	Five gasoline-powered fleet vehicles (full-size pick-ups, vans) were retired in favour of compact, fuel efficient pickups and a hybrid SUV.
Established anti-idling behaviour change program (e.g. signs, stickers, messages)	In progress	Observed reduction in vehicles (busses, private) idling while awaiting release of students for pickup	Signage installation on-going. Information to be issued to schools for incorporation into newsletters in 2009/10.

1.2 Stationary fuel combustion and electricity

Action	Action Taken	Outcome/Performance Measure	Notes Clarifying Action Taken
Replaced # computers with EnergyStar models	In progress	Reduced electrical consumption	On-going program "Evergreen"
Replaced Refrigerators (EnergyStar rated appliance)	In progress	Reduced electrical consumption	Replaced two refrigerators - one at Board Office, other at Delta Manor Elementary
Replaced standard bulbs with CFLs	In progress	Reduced electrical consumption	Mostly complete in the District, but when discovered, replace incandescent with CFLs or LEDs
Installed motion activated lights	In progress	Reduced electrical consumption	Installed occupancy sensors in 12 Classrooms at Port Guichon Elementary
Undertaken lighting retrofit	In progress	Reduced electrical consumption	Replaced all fluorescent lamps with energy efficient, lower wattage T8's
Utilized desk-top power management settings on computer	In progress	Undetermined savings as yet	On-going program to install Deep Freeze software to power-down computers and peripherals
Initiated corporate computer shut-down/wake-up for maintenance	In progress	Undetermined savings as yet	On-going program to install Deep Freeze software to power-down computers and peripherals

Initiated or completed a building energy retrofit	In progress	Phase 1 savings estimated at 4,400 GJ/year	Completed heating audit at 20 schools, replaced 101 existing gas-fired rooftop heating units with air source electric heat pumps c/w gas 2nd stage backup at 9 schools (Phase 1)
Upgraded DDC Controls	In progress	Savings 6,720 kWh/yr	On-going multi-year replacement project to standardize building controls at all sites to be managed via web. Changed Weekly Schedule for outside lighting controls to turn on at 6.30am as opposed to 6:00am (40 kw/day savings)
Installed window roll shutters to help reduce heat loss when rooms not in use	In progress	Undetermined savings as yet	Installed roll shutters on all ground floor windows at Devon Gardens and Sunshine Hills Elementaries

1.3 Supplies

Action	Action Taken	Outcome/Performance Measure	Notes Clarifying Action Taken
Used collaborative software to edit on-line	In progress	Eliminate need for paper copies	Continue to use FirstClass software for e-mail, discussion groups, collaboration and data repository
Re-used non-confidential scrap paper	In progress	Reduced paper being sent to recycling	Not system-wide
Used laptops/tablets	In progress	Marked reduction in paper consumption	Board packages, budget documents, etc. all e-mailed and stored in FirstClass for staff and trustees to retrieve on their assigned laptops
Chose "Green" items from Distribution Centre	In progress	Increased use of environmentally-friendly cleaning products	In Custodial operations
Encouraged re-use of furniture and equipment	In progress	Marked decrease in saleable assets in 2008	Mostly student desks, office furniture

1.4 Employee Engagement

Action	Action Taken	Outcome/Performance Measure	Notes Clarifying Action Taken
Provided climate change education	In progress	Undetermined at this time	Held an all-day Plenary for District and School Administration dedicated to sustainability and awareness, held on-going meetings with school staff and senior management regarding initiatives underway and forthcoming
Developed Green Teams	In progress	Increased awareness and accountability by staff and students	Individual Schools have undertaken Green Team Initiatives, Recycling, Energy Audits & awareness.

Supported professional development	In progress	Undetermined at this time	Held an all-day Plenary for District and School Administration with workshops on global warming, energy conservation, waste reduction and other sustainability measures within the Delta School District. Facilities Branch presentation on reducing the carbon footprint, past & future projects. In addition, District staff attended numerous seminars and workshops on climate change and energy management.
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1.5 Sustainability Actions (others)

Action	Action Taken	Outcome/Performance Measure	Notes Clarifying Action Taken
Ran dishwasher only when full	In progress	Undetermined at this time	Piloted program at School Board Office
Reduced/replaced bottled water with filtered or refrigerated water	In progress	Undetermined at this time	Piloted program at School Board Office
Improved recycling measures	In progress	Increased amount of waste diverted from landfills to recycling plants	Reviewing other programs to better sort recyclables, budget permitting
Used re-usable dishes	In progress	Undetermined at this time	Piloted program at School Board Office
Purchased green cleaning products	In progress	Healthier buildings and staff; increased amount of waste diverted from landfills to recycling plants	Utilizing cleaning products that are less harmful to the environment; utilizing RTD (ready-to dispense) concentrated cleaning products which come in recyclable containers and mix with water, thus reducing packaging.
Used green (low-e paints)	In progress	Healthier buildings and staff; reduction in volatile compounds entering sewage stream	

Part 2: Plans to Continue Reducing Greenhouse Gas Emissions 2009 -- 2011

Overview	<p>Our goal, in accordance with the Provincial Climate Change Action Plan, will be to continue to identify opportunities for: the reduction of GHG emissions in all aspects of our business, thus working towards carbon neutrality; the reduction of electricity consumption; and the implementation of alternative, "green" energy sources.</p> <p>An extensive audit will be carried out to identify and recommend to Delta School District Senior Management changes to basic use of supplies, i.e. default two-sided coping, re-use of non-confidential paper, electronic reports over paper reports, recyclable dishes and cutlery, reduction in packaging and recycling of cardboard, etc.</p> <p>Another audit will be carried out to determine the level of participation throughout the District for energy conservation, waste reduction, carbon footprint reduction, etc.</p> <p>We also plan to develop a program to enlist schools to participate in a Total Sustainability Program, with financial support from the District through energy cost savings.</p>
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2.1 Mobile Fuel Combustion

Action	Action Planned	Outcome/Performance Measure	Notes Clarifying Action Taken	Timeframe
	In progress	Reduced gasoline consumption	Continue to replace gasoline or diesel-powered fleet vehicles with "right-sized", more fuel efficient vehicles with a consideration made to alternate energy sources where practicable and cost effective.	On-going
Replace # of TYPE OF VEHICLE with MORE EFFICIENT VEHICLE/Hybrid	Planned	Reduced gasoline consumption and wear-and-tear on vehicles		Winter 2010
Provide driver training to reduce fuel use	In progress	Reduced gasoline consumption and wear-and-tear on vehicles; increased service life of fleet	New in-house service, to replace outsourced service, providing improved quality control, scheduled preventative maintenance and timely repairs and adjustments to improve vehicle and grounds equipment performance and fuel efficiency. Regular reports to recommend remedial action, including replacement of vehicles and equipment.	On-going
Initiate new fleet maintenance program (could include – changing filters, checking tire pressure, regular check-ups)	In progress	Observed reduction in vehicles (busses, private) idling while awaiting release of students for pickup	Complete signage installation and issue information to all schools for incorporation into newsletters.	Spring 2010

2.2. Stationary Fuel Combustion (including electricity):

Action	Action Planned	Outcome/Performance Measure	Notes Clarifying Action Taken	Timeframe
Undertake workstation tune-ups to help staff understand what they can do to reduce personal energy use	Planned	Reduced electrical consumption	Introduce "Staff Awareness Programs"	Fall 2009
Undertaken Monitor turn-off challenge	Planned	Reduced electrical consumption	Introduce "Staff Awareness Programs"	Fall 2009
Replace # computers with EnergyStar models	In progress	Reduced electrical consumption	On-going program "Evergreen"	On-going
Encourage staff to use stairs	Planned	Reduced heating/cooling demand	Introduce "Staff Awareness Programs"	Fall 2009
Turn off lights in unused rooms	In progress	Reduced electrical consumption	Introduce "Staff Awareness Programs", install "Turn It Off" PowerSmart stickers at all light switches.	Fall 2009
Replace Refrigerators (EnergyStar rated appliance)	In progress	Reduced electrical consumption	Establish District Policy/Procedure to ensure Procurement Services only purchases EnergyStar rated appliances when the need arises	Fall 2009
Replace other appliances (with EnergyStar rated appliance)	In progress	Reduced electrical consumption	Establish District Policy/Procedure to ensure Procurement Services only purchases EnergyStar rated appliances when the need arises	Fall 2009
Install multi-function devices (and remove stand-alone printers/faxes)	Planned	Reduced electrical consumption, paper consumption (duplexing)	Will replace equipment when needed and as budget permits	On-going
Replace standard bulbs with CFLs	In progress	Reduced electrical consumption	Mostly complete in the District, but when discovered, replace incandescent with CFLs or LEDs	On-going

Install motion activated lights	In progress	Reduced electrical consumption	Upon completion of energy audits in buildings, install where practicable	On-going
Undertake lighting retrofit	In progress	Reduced electrical consumption	Currently replacing dimmable incandescent fixtures with LEDs in theatres	2010
Implement server virtualization	Planned	Reduced electrical consumption, room cooling	Currently under review as part of District Technology Plan. If cost effective, and if budget permits, may look to pilot.	2011
Utilize desk-top power management settings on computer	In progress	Energy Savings increased to original Dep. Freeze units. Minimum 254 KWh/yr each unit for remaining 1500 units (381,000 KW/yr)	To install Power Saving Program to approx 5000 computers. Install Deepfreeze/ Power Save programs to all Macs (500) & all Administration, Teachers & Classroom Computers (1000)	Fall 2009
Initiate corporate computer shut-down/wake-up for maintenance	In progress	Energy Savings increased to original Dep. Freeze units. Minimum 254 KWh/yr each unit for remaining 1500 units (381,000 KW/yr)	To install Power Saving Program to approx 5000 computers. Install Deepfreeze/ Power Save programs to all Macs (500) & all Administration, Teachers & Classroom Computers (1000)	Winter 2009
Apply for LEED existing building rating	Planned	Undetermined quantity of savings	Introduce "Staff Awareness Programs"	Fall 2009
Undertake building energy audit at LOCATION(s)	Planned	Complete audit to determine future energy reduction projects	Complete Building Audits of all schools	Winter 2009
Undertake building energy audit at LOCATION(s)	In progress	Phase 2 savings estimated at 5,000 GJ/year Phase 3 savings estimated at 7,800-8,600 GJ/year	2009: Replace 98 existing gas-fired rooftop heating units with air source electric heat pumps c/w gas 2nd stage backup at 11 schools (Phase 2). Currently undertaking a study at 2 school sites to replace 92 existing RTUs with either air source electric heat pumps c/w gas 2nd stage backup or ground source heat pumps c/w gas 2nd stage backup (Phase 3A, would also include domestic hot water heating). Plan to undertake a study at other 2 school sites to replace 49 existing RTUs with either air source electric heat pumps c/w gas 2nd stage backup or ground source heat pumps c/w gas 2nd stage backup (Phase 3B, would also include domestic hot water heating).	Phase 2 - Fall 2009, Phase 3A - Fall 2010, Phase 3B - Fall 2011
Upgraded DDC Controls	In progress	Savings 6,720 kWh/yr	On-going multi-year replacement project to standardize building controls at all sites to be managed via web. Changed Weekly Schedule for outside lighting controls to turn on at 6.30am as opposed to 6:00am (40 kw/day savings)	

2.3 Supplies

Action	Action Planned	Outcome/Performance Measure	Notes Clarifying Action Taken	Timeframe
Commit to use 30% recycled paper	Planned	Once existing paper stocks depleted, replace with 30% recycled for general printing/copying - target 90% use	Depends on quality of presentation (i.e. higher quality brochures may not be able to be done on 30% recycled).	Winter 2009
Commit to use 100% recycled paper			Cost-benefit concern - more expensive, tougher on printers and copiers.	
Initiate automatic double sided printing	Planned	Reduced paper by count	Will implement default double-sided copying in 2009 where photocopiers have such setting. As older copiers and printers are replaced, will replace with models capable of duplexing defaults	Copiers by Summer 2009, rest as necessitated
Commit to hold paperless meetings	Planned	Reduced paper by count	District Policy/Procedure needed to be developed	Winter 2010
Develop document library (online and one printed copy) for large documents	In progress	Reduced paper by count	In Facilities Branch, will convert drawings to PDF files stored on server to avoid paper reproductions. Policies, procedures and other District documents stored on District website and intranet for download and viewing.	Winter 2010
Use collaborative software to edit on-line	In progress	Eliminate need for paper copies	Continue to use FirstClass software for e-mail, discussion groups, collaboration and data repository.	On-going
Re-use non-confidential scrap paper	In progress	Reduced recycling of paper	If going double-sided, paper will not be useable for scrap.	On-going
Use laptops/tablets	Planned	Reduced hard-cover book purchase, reduced paper	Implement student & staff laptop program as part of District Technology Plan. Highly dependent on cost to purchase laptops and willingness of parents to pay in instalments.	Fall 2011
Purchase cradle to cradle goods	In progress	Reduced purchase of paper	Close District Print Shop - the convenience of having an in-house print shop will be gone, so print requests to outsourced firms should be re-thought and paperless solutions to communicate developed.	Fall 2009
Choose "Green" items from Distribution Centre	In progress	90% environmentally-friendly products used in cleaning		On-going
Encourage re-use of furniture and equipment	In progress	Increased recycling of student furniture, with any broken or obsolete furniture or equipment sent to recycler		On-going

2.4 Travel

Action	Action Planned	Outcome/Performance Measure	Notes Clarifying Action Taken	Timeframe
Install Video Conferencing facilities	Planned	Undetermined at this time	Under review for future implementation, budget permitting	fall 2011

2.5 Employee Engagement				
Action	Action Planned	Outcome/Performance Measure	Notes Clarifying Action Taken	Timeframe
Provide climate change education	Planned	Increased awareness and conservation measures throughout District	Develop "Green Teams" at all schools and enhance education program support to schools in environmental stewardship.. Develop a web page with news, resources and tips available for staff, students and parents to access.	Winter 2009
Provide conservation education	Planned	Increased awareness and conservation measures throughout District	Develop "Green Teams" at all schools and enhance education program support to schools in environmental stewardship.. Develop a web page with news, resources and tips available for staff, students and parents to access.	Winter 2009
Hold contests to change behaviour/make pledge	Planned	Increased awareness and conservation measures throughout District	Develop "Green Teams" at all schools.	Winter 2009
Hold contests/support to generate ideas	Planned	Increased awareness and conservation measures throughout District	Develop "Green Teams" at all schools.	Winter 2009
Develop Green Teams	Planned	To help organize an environment to encourage sustainability programs with participation from all levels within the District	Offer enrolment to a "Green Team System" to all sites with benchmarks, aims and goals	Fall 2009
Support Green Teams (resources)	Planned	Goals: to develop an environment to encourage sustainability within each school that will be continual.	Provide funding to sites that organize and maintain a "Green Team" with goals reached.	Fall 2009
Provide green tips	Planned	Increased awareness and conservation measures throughout District	Provide information for Green Teams to disseminate. Develop a web page with news, resources and tips available for staff, students and parents to access.	Winter 2009
Support professional development	In progress	Increased awareness and conservation measures throughout District	District staff to continue to attend webinars, seminars and workshops on climate change and energy management.	On-going
Add a green work goal to performance management	Planned	Goals is to develop a framework to assist Schools in forming Green Teams and their goals	Committee to consist of all educational partners and departments championing the cause.	Summer 2009
2.6 Sustainability Actions (others)				
Action	Action Planned	Outcome/Performance Measure	Notes Clarifying Action Taken	Timeframe
Take water conservation measures – low flow showers or toilets, fix leaks	Planned	Reduction in water consumption	Green Teams to report any excessive water use to school administration - work order to maintenance to repair or behavioural change to be implemented	Winter 2009
Run dishwasher only when full	In progress	Reduction in water consumption	Green Teams to monitor and report compliance to school administration and Energy Manager	Winter 2009

Reduce/replace bottled water with filtered or refrigerated water	In progress	Decreased amount of waste sent to landfills.	Green Teams to undertake review and report possible projects to school administration and Energy Manager. If budget permits, install filtered water dispensers	Spring 2010
Improve recycling measures	In progress	Increased amount of waste diverted from landfills to recycling plants.	Green Teams to undertake review and report possible enhanced programs to school administration, Energy Manager and Manager of Facility Services. If budget permits, implement changes	Spring 2010
Support composting	Planned	Decreased amount of food waste sent to landfills.	Green Teams to undertake review and report possible enhanced programs to school administration, Energy Manager and Manager of Maintenance Services. If budget permits, implement projects.	Spring 2010
Use re-usable dishes	In progress	Decreased amount of waste sent to landfills.	Green Teams to monitor and report compliance to school administration and Energy Manager	Winter 2009
Purchase green cleaning products	In progress	Healthier buildings and staff; increased amount of waste diverted from landfills to recycling plants	Utilizing cleaning products that are less harmful to the environment; utilizing RTD (ready-to dispense) concentrated cleaning products which come in recyclable containers and mix with water, thus reducing packaging.	On-going
Use green (low-e paints)	In progress	Healthier buildings and staff; reduction in volatile compounds entering sewage stream		On-going
Support sustainable procurement practices	Planned	Social responsibility, "walking the talk"	Revise existing District Policy regarding procurement to include sustainable methods of manufacturing, delivery and recycled content of goods.	Spring 2010