

# **SD 44 North Vancouver - 2012 Carbon Neutral Action Report**

**30 April 2013**

## **Executive Summary**

The North Vancouver School District's active pursuit of energy conservation measures over the past decade has placed it solidly on the path towards carbon neutrality. In 2003, NVSD 44 won a BC Hydro Power Smart Partner Excellence award in recognition of numerous eco-efficiency upgrades including lighting retrofits, mechanical upgrades, and the installation of a centralized building automation system. In 2005, our Energy Conservation Initiative Project resulted in even further reductions in electricity, natural gas and water consumption.

In more recent years, our ambitious capital replacement program has targeted the replacement of facilities at the end of their life cycles, with new or remodelled facilities featuring energy efficient mechanical systems and high performance building envelope assemblies.

Our pursuit of sustainable building and maintenance practices has been closely tied to operating costs. Proposed changes to our facilities, equipment, and operating procedures are evaluated on the basis of their return on investment as well as their "green" value. This results in what we believe money spent wisely, with an eye to the future.

In 2010, NVSD 44 celebrated 40 years of educating students throughout the lower mainland in environmental sustainability at the North Vancouver Outdoor School near Squamish. In 2012, we continued the celebration with the opening of the new Environmental Learning Centre at the Outdoor School. This unique facility will support our sustainability goals by promoting eco awareness to students for years to come.

## **Overview**

### **2012 Greenhouse Gas Emissions**

SD 44's Greenhouse gas (GHG) emissions from all sources covered by the Greenhouse Gas Reduction Targets Act, as reported in SMARTTool totalled 4821 tonnes of carbon dioxide equivalent.

### **Offsets Applied to Become Carbon Neutral in 2012**

SD 44's offset investments totalled \$126,551.25 to become carbon neutral in 2012.

82 tonnes of carbon dioxide equivalent emissions from school buses and biogenic fuels have been recorded as part of the total greenhouse gas emissions, but offsets were not required under the Greenhouse Gas Reduction Targets Act.

## **Actions Taken to Reduce Greenhouse Gas Emissions in 2012**

Initiatives undertaken by SD 44 in 2012 to reduce our energy consumption and our corresponding carbon footprint include the following:

- Extensive renovations of Queen Mary Elementary continued. The renewed facility will maintain its heritage status while targeting a “LEED” Gold rating.
- Extensive renovations of Balmoral Junior Secondary school were started. The renewed facility, renamed Mountainside Secondary, will consolidate a programs previously offered at 3 separate locations, allowing the closure of those aging facilities.
- Renovations and new construction at Carson Graham Secondary School was completed. The new energy efficient facility is targeting a “LEED” Gold rating.
- Construction was completed on the new Artists for Kids facility combined with a new Education Services Centre. The new facility consolidates various programs and departments in a central, energy efficient facility targeting a “LEED” Gold rating. This facility also includes the Lonsdale Energy Corporations district energy plant which extracts geothermal energy from below the site to provide heat to the Education Services Centre and to surrounding residential developments. This joint venture between SD 44 and the City of North Vancouver was the recipient of the Community Energy Association/UBCM 2012 Climate and Energy Action award.
- Construction of the new Environmental Learning Centre was completed at our Outdoor School facility near Squamish BC. Designed to provide a working example of sustainable building practices, this facility pilots many new technologies including ground water source heat extraction, grey water non potable water systems and natural ventilation strategies. This facility is targeting a “LEED” Platinum rating.
- A new boiler was installed at Seymour Heights Elementary School to supplement the operation of the existing boiler that has exceeded its life expectancy. The new high efficiency boiler will operate during shoulder heating seasons, requiring use of the old boiler only during extreme or extended cold weather events.
- A partial mechanical upgrade to Brooksbank Elementary was completed. The scope of work included installation of a new boiler, repair and cleaning of ductwork and, an upgrade of the DDC system controls. While more remains to be done, the work undertaken under the Carbon Neutral Capital Plan will improve reliability and distribution of heat throughout the school.
- A partial mechanical upgrade to Cove Cliff Elementary was also completed. The scope of work included installation of a new boiler, and an upgrade of the DDC system controls. This work was also undertaken under the Carbon Neutral Capital Plan.
- Commissioning of a new solar heated domestic hot water system installed as part of the Carson Graham Secondary School project is currently in progress.
- Launched BC Hydro’s Workplace Conservation Awareness Program at 11 schools. This program is designed to support teachers in implementing school level energy conservation campaigns to encourage peers and students to make simple actions such as turning off lights, to save electricity.

- Continuation of a district wide program to optimize lighting and reduce energy consumption by replacing metal halide light bulbs with new induction and LED fixtures in five schools.
- Continuation of a pilot program to review and optimize HVAC control measures and to better align mechanical system operating schedules with occupancy.
- Continuation of our program to reduce waste by providing separate, in ground, garbage and recyclable containers at heavily used sports and recreational facilities.
- Continuation of our program to reduce interschool transport of supplies and equipment to reduce GHG emissions from vehicles used for deliveries.

## **Operational Changes in 2012**

Actions in support of sustainability and GHG reductions included:

- Review of maintenance and custodial operations at the new Ridgeway Elementary facility to support our application for a LEED Gold rating. Introduction of green cleaning procedures are being piloted.
- Maintenance and custodial operations at the new Artists for Kids and Education Services Centre are also being reviewed to support our application for a LEED Gold rating. Introduction of green cleaning, green landscape maintenance and pest control procedures are being piloted
- Renewal of the contract with our Energy Manager with the support of BC Hydro. The Strategic Energy Management Plan developed by the Energy Manager will further develop a culture of energy efficiency and sustainability within our organization and provide direction for future programs and projects to reduce energy consumption.
- Investigation of programs to eliminate organic materials from the waste stream by introducing new collection strategies.

## **Plans to Continue Reducing Greenhouse Gas Emissions 2013 – 2014**

Plans for the future include:

- Completion of Queen Mary Elementary School. This school will also connect to the City of North Vancouver's district energy plant, resulting in reductions in GHG emissions. Further reductions to utility consumption are anticipated as a result of its energy efficient operating systems and high performance building envelope assembly.
- Implement equipment upgrades and operational changes in response to the findings of the Continuous Optimization Program currently in progress at 4 of our secondary schools. The program, undertaken in co-operation with BC Hydro, benchmarks utility consumption over a 9 month period in order to identify the most effective opportunities for re-commissioning .

- Develop new programs at the new Environmental Learning Centre in Squamish to demonstrate examples of sustainable building and operations that will be key concepts for future generations.
- Initiate an engineering review of Sherwood Park Elementary. Our utility consumption monitoring program, PUMA, has identified above average utility consumption at this school.
- Continue district wide review of our DDC Mechanical control system to identify energy saving opportunities by adjusting mechanical system operation schedules and sequences.



Georgia Allison  
Secretary Treasurer  
North Vancouver School District 44

## School District 44 North Vancouver - 2012 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	Steps Taken	Steps Planned	Start Year	End Year
<b>Mobile Fuel Combustion (Fleet and other)</b>					
<b>Behaviour change program</b>					
Encourage carpooling in fleet vehicles	In Development	Specially marked stalls provided as incentives for Education Services Staff to carpool	Review usage. Expand program if successful.	2012	No End Date (Continuous)
<b>Other Mobile Fuel Combustion Actions</b>					
Reduce use of heavy duty vehicles for "on demand" interschool transfers of furniture, supplies and equipment.	Ongoing/In Progress	Continuing a program to consolidate and schedule interschool transport of supplies and equipment. Program has resulted in operating efficiencies and a reduction of GHG emissions from vehicles used for deliveries	Continue the program	2010	No End Date (Continuous)
<b>Vehicle fuel efficiency</b>					
Replace vehicles with more fuel-efficient models	Ongoing/In Progress	No new vehicles purchased in 2012	Replace aging vehicles as funding becomes available	2008	No End Date (Continuous)
Replace larger vehicles with smaller models according to fleet "right-sizing" principles	Ongoing/In Progress	No new vehicles purchased	Replace aging vehicles with new vehicles, size appropriate to duty, as funding becomes available	2008	No End Date (Continuous)
Perform regular fleet maintenance to improve fuel-efficiency	Ongoing/In Progress	Regular preventative maintenance service scheduled for all vehicles every 10,000 kms	Continue the program	2008	No End Date (Continuous)
<b>Stationary Fuel Combustion, Electricity</b>					
<b>Behaviour change program</b>					
Ask staff to unplug electrical equipment or switch off power bars when not in use	In Development	BC Hydro's Workplace Conservation Awareness program introduced to staff and students.	Programs to change behavior of students and staff that were developed as part of the Workplace Conservation Awareness program will be piloted	2008	No End Date (Continuous)
Ask staff to close blinds at end of work day to reduce heating/cooling demands	In Development	Custodian staff reminded to close blinds at end of school day. Program to completely replace ineffective window coverings in schools started.	Continue program	2011	No End Date (Continuous)
Provide reminders for turning off lights (e.g., signs, stickers, messages)	Ongoing/In Progress	Planned participation in BC Hydro's Workplace Conservation Awareness program.	Continue to implement program.		No End Date (Continuous)
<b>IT power management</b>					
Install power management software which shuts down computers outside of regular business hours	Ongoing/In Progress	Completion of "Green IT" report in co-operation with BC Hydro	Implement recommendations from "Green IT" report	2011	No End Date (Continuous)
Implement server virtualization	Ongoing/In Progress	Continue to centralize and virtualize servers in new Education Service Centre.	Continue the program	2008	No End Date (Continuous)
Apply auto-sleep settings on computer monitors and CPUs	Ongoing/In Progress	Program ongoing from previous years	Continue with program.	2008	No End Date (Continuous)
Remove stand-alone printers, copiers, and/or fax machines and install multi-function devices as part of a print management strategy	Ongoing/In Progress	Commissioned a district wide study of printers, faxes, scanners, and copiers. The resulting "Docutivity" program developed a strategy for reducing energy by providing centralizing printing stations and reducing stand alone single purpose printers and scanners.	Continue to implement recommendations of the program	2012	No End Date (Continuous)
Apply auto-sleep settings on printers, fax machines, and/or multi-function devices	Ongoing/In Progress	Program ongoing from previous years	Continue with program.	2008	No End Date (Continuous)
Replace computers with ENERGY STAR models during regular computer upgrades	Ongoing/In Progress	Computers replaced at the end of their life cycle with new Energy Star rated models.	Continue with program.		No End Date (Continuous)
<b>Other Stationary Fuel Combustion</b>					
Enroll in a building energy benchmarking program (eg. GREEN UP)	Ongoing/In Progress	Utility use data tracked with by "PUMA" (Prism Utility Monitoring and Analysis)	Continue tracking utility consumption. Use data to compare energy use between sites.	2011	No End Date (Continuous)

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Action	Status	Steps Taken	Steps Planned	Start Year	End Year
Install an on-site renewable energy demonstration project	Ongoing/In Progress	Review performance of solar hot water demonstration project at Carson Graham	Future installations dependant on performance review of solar hot water installation at Carson Graham	2012	No End Date (Continuous)
Incorporate integrated design process into new construction or during renovations of owned buildings	Ongoing/In Progress	Queen Mary Elementary developed using integrated design process	Continue the process on capital projects.	2010	No End Date (Continuous)
<b>Owned buildings</b>					
Establish energy performance baseline for owned buildings	Ongoing/In Progress	Electrical, Gas and Propane use at all schools entered into our utility monitoring program "PUMA"	Continue tracking utility consumption. Use data to compare energy use between sites and identify buildings for improvements.	2011	No End Date (Continuous)
Achieve LEED NC Gold certification at a minimum for new construction or major renovations	Ongoing/In Progress	Applications in progress for LEED NC Gold rating for the new Education Services Centre, Carson Graham Secondary, and Ridgeway Elementary schools.  Application in progress for LEED NC Platinum rating for new Environmental Learning Centre at NVOS	Apply for LEED NC Gold rating for Queen Mary Elementary School at the completion of renovations.	2012	No End Date (Continuous)
Incorporate a refrigerant management strategy into regular building management/maintenance to reduce fugitive emissions	Ongoing/In Progress	Our existing schools do not use air conditioning. Westview, Sutherland, Highlands, Ridgeway and Carson Graham facilities however do have refrigerant in heat pumps and a refrigerant management strategy will be required.	Develop a plan to convert to C02 refrigerants	2008	No End Date (Continuous)
<b>Planning/management</b>					
Install a real time metering system (e.g. Pulse, Reliable Controls, Houle Controls)	Ongoing/In Progress	New metering installed in Handsworth, Sutherland, Windsor, and Seycove Secondaries as part of BC Hydro's Continuous Optimization Program. Additional metering also installed in the new Carson Graham Secondary schools and the Education Services Centre .	Installation of real time metering will be included at the new Queen Mary Elementary school.	2012	No End Date (Continuous)
<b>Retrofit details for owned buildings</b>					
Upgrade mechanical systems (heating, cooling, ventilation) during retrofits	Ongoing/In Progress	Participated in BC Hydro's Continuous Optimization Program to measure energy use in 4 secondary schools. Information will be used to identify equipment or operating schedules requiring recommissioning.  Replaced boilers in Seymour Heights Elementary School  Partial mechanical upgrades in Brooksbank and Cove Cliff Elementary Schools as part of the Carbon Neutral Action Plan.	Implement actions energy saving opportunities identified by Continuous Optimization Program. Pilot a similar program for Elementary schools.  Initiate engineering study to determine return on investment from replacing aging boiler in Sherwood Park Elementary School.	2012	No End Date (Continuous)
Upgrade lighting systems during retrofits	Ongoing/In Progress	Replaced metal halide bulbs in existing fixtures with lower wattage LED or induction lamps	Classroom lighting upgrades planned for schools omitted from 2010 program.	2012	2013
Upgrade/adjust control systems during retrofits	Ongoing/In Progress	Update software and realign DDC operating schedules to building occupancy at 35 locations.	Continue to review DDC settings to reduce drift and inefficient operation of mechanical systems.	2012	2013
Improve building insulation (including windows) during retrofits	Ongoing/In Progress	Improved thermal performance of wall assemblies and glazing will be part of integrated approach to re-design of Queen Mary school		2012	2013

### Supplies (Paper)

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Action	Status	Steps Taken	Steps Planned	Start Year	End Year
<b>Electronic media in place of paper</b>					
Install collaborative software for electronic editing (e.g. SharePoint, Groove, etc.)	In Development	School District currently using "First Class" as our collaborative software. Study completed to identify benefits of switching to SharePoint.	Transition to "SharePoint"		No End Date (Continuous)
Use electronic document library for filing common documents	Ongoing/In Progress	Sites on intranet for posting of notices, documents and shared resources: NVSD Media, Manager Central, Employee Central.  Records Central Management program initiated to reduce duplication and storage of obsolete paper files. Introduced new program to create and store records electronically.	Transition shared posting sites to "SharePoint" software.  Records Management program continuing transition from paper to electronic record keeping	2009	No End Date (Continuous)
Switch to an electronic payroll notification system in place of paper pay stubs	Ongoing/In Progress	Continue electronic payroll advice and auto deposit	Continue program		No End Date (Continuous)
<b>Paper Type</b>					
Purchase 30% post-consumer recycled paper	Ongoing/In Progress	25% of total paper purchased contains 30% recycled paper.	Continue with program, and monitor any changes in paper supply costs.	2009	No End Date (Continuous)
Purchase 40% post-consumer recycled paper	Ongoing/In Progress	Update previous cost analysis comparing cost of recycled paper to non recycled paper.	Monitor changes in paper supply costs. Increase recycled content as cost of recycled paper drops.	2009	No End Date (Continuous)
<b>Printer/document settings</b>					
Switch networked printers and photocopiers to automatic double-sided	Ongoing/In Progress	New copier machines have automatically double sided printing as the default setting.	Continue with automatic double side printing	2012	No End Date (Continuous)

## School District 44 North Vancouver - 2012 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

Action	Status	Steps Taken	Steps Planned	Start Year	End Year
<b>Education, Awareness, and Engagement</b>					
<b>Awards/Recognition</b>					
Establish a sustainability/green awards or recognition program	Not Yet Evaluated				No End Date (Continuous)
<b>Staff Professional Development</b>					
Support green professional development (e.g., workshops, conferences, training)	Ongoing/In Progress	Strategic Energy Management Plan emphasized importance of sustainability training for maintenance/custodial staff	Provide speakers at staff Pro D events to explain and highlight benefits of recent and proposed operational changes to enhance energy conservation and sustainability.	2012	No End Date (Continuous)
<b>Staff awareness/education</b>					
Provide education to staff about the science of climate change	Not Yet Evaluated				No End Date (Continuous)
Provide education to staff about the conservation of water, energy, and raw materials	Ongoing/In Progress	10 year Strategic Plan identified high level goal to "provide leadership in environmental education and sustainability practice".  Installation of Energy Use Dashboard at Environmental Learning Centre at the NVOS to raise awareness by staff and students of energy use levels	Support environmental education and sustainability initiatives.  Update DDC software to support the installation of Energy Use Dashboards at Carson Graham, Queen Mary Elementary, Ridgeway and Education Services Centre.	2011	No End Date (Continuous)
Provide green tips on staff website or in newsletters	Ongoing/In Progress	Green Fair held to celebrate student achievements in conservation and sustainability	Student Leadership Council, and Destination Conservation meetings to further develop sustainability issues.		No End Date (Continuous)
<b>Team-building</b>					
Create Green, Sustainability, Energy Conservation, or Climate Action Teams with executive endorsement	Ongoing/In Progress	The need of behaviour change recognized and has been included in the Strategic Energy Management Plan developed in partnership with BC Hydro.	Continue to develop and encourage sustainability initiatives at all schools.	2010	No End Date (Continuous)
Provide resources and/or dedicated staff to support teams	Ongoing/In Progress	The scope of services provided by the Energy Manager was expanded to include a program specializing in behavioural change with a primary focus on energy conservation and sustainability practices suitable for school environments.	Continue with program.	2011	No End Date (Continuous)
Providing behaviour change education/training to teams (e.g., community-based social marketing)	Ongoing/In Progress	Developed opportunities to celebrate actions, successes and facilitate idea exchanges through events such as the annual Green Fair, Workplace Conservation Awareness programs, sustainability leadership teams and social media.	Continue to expand participation in sustainability issues. Highlight sustainability features incorporated into design of LEEDS Gold schools.	2010	No End Date (Continuous)
<b>Other Sustainability Actions</b>					
<b>Building construction, renovation</b>					
Establish a policy to reuse materials where possible and divert construction and demolition debris from landfills and incineration facilities	Ongoing/In Progress	Lumber, millwork, valves, light fixtures, pumps, boilers and even mechanical control panels were salvaged from schools demolished as part of capital programs at Ridgeway, Carson Graham, Queen March and Balmoral schools.	Salvaged materials will be recycled as part of maintenance programs at other schools or, incorporated into new schools under the LEED NC programs.	2008	No End Date (Continuous)
Incorporate lifecycle costing into new construction or renovations	Ongoing/In Progress	Lifecycle costing and payback analysis included in integrated design process for projects targeting LEED NC ratings.	Continue with programs.	2009	No End Date (Continuous)
<b>Commuting to and from home</b>					
Offer staff a compressed work week	Not Yet Evaluated				No End Date (Continuous)
Encourage commuting by foot, bicycle, carpool or public transit	Ongoing/In Progress	Safe Routes to School studies encouraged walking, bicycling and public transit for commuting to schools.	Minor infrastructure changes (reduction in parking stalls, addition of bike racks etc) to encourage use of alternate transportation modes.	2010	No End Date (Continuous)



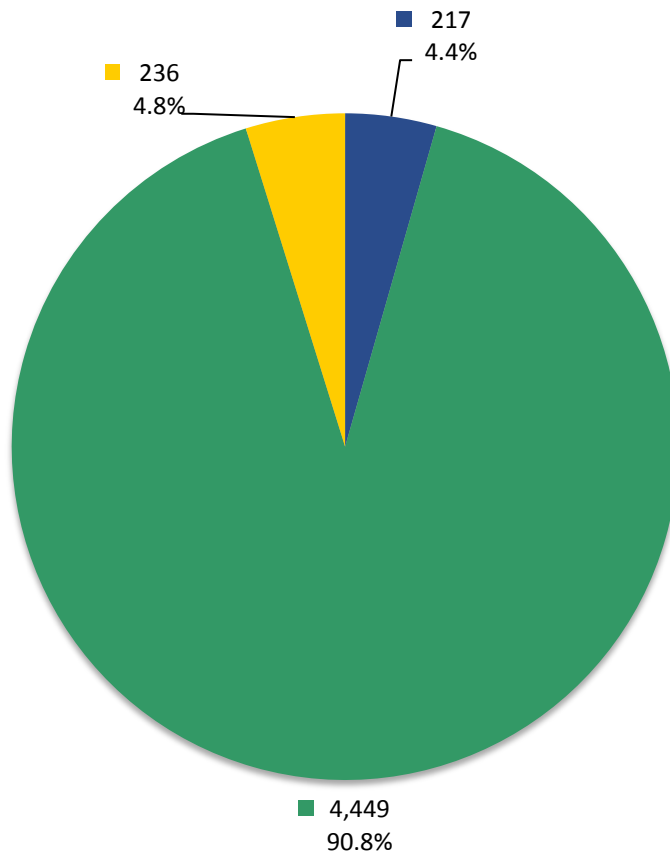
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The actions listed below contribute to a reduction in greenhouse gas emissions from sources that fall outside of the reporting requirements defined in the carbon neutral government regulation of the Greenhouse Gas Reduction Targets Act. Public sector

Action	Status	Steps Taken	Steps Planned	Start Year	End Year
Provide shower or locker facilities for staff/students who commute by foot or by bicycle	Ongoing/In Progress	Shower and locker facilities provided at the new Education Services Centre.	Encourage staff to bicycle to work.	2012	No End Date (Continuous)
Provide secure bicycle storage	Ongoing/In Progress	Secure bicycle parking provided in new Education Services Centre.	Review bicycle racks locations at schools with regards to security and protection from weather.	2012	No End Date (Continuous)
<b>Other Sustainability Actions</b>					
Incorporate low volatile organic compounds (VOCs) standards into procurement policy for products such as paints, carpets and furniture	Ongoing/In Progress	Low VOC coatings specified for gym floor refinishing. Interior painting projects use low VOC based products.	Continue the programs.		No End Date (Continuous)
<b>Procurement (non-paper supplies)</b>					
Establish green standards for goods that are replaced infrequently and/or may require capital funds to purchase (e.g., office furniture, carpeting, etc.)	Not Yet Evaluated				No End Date (Continuous)
Implement sustainable purchasing program for cleaning products, disposable paper products and trash bags	Ongoing/In Progress	Custodial Department implemented a "green clean" program at ESC/AFK and Ridgeway. Use of harsh chemicals for cleaning discontinued in favour of water and microfibre.	Follow up programs planned for the new Carson Graham Secondary, Queen Mary Elementary, and the NVOS	2012	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	Paper, Plastic and Metal recycling programs have been in place for a number of years at each of our facilities. Program to install in ground storage containers for waste and recycled materials was continued.	Continue program to install in ground waste and recycling containers. This program continues to reduce frequency/use of heavy vehicles for pick ups. Initiate plans to divert organic waste for garbage stream.	2008	No End Date (Continuous)
Implement a hazardous waste reduction and disposal strategy	Ongoing/In Progress	SD44 has an annual program to identify and remove hazardous wastes collected in our schools during the year. A program to remove and recycle obsolete electronic equipment was started in 2009 in connection with an annual "Clear the Clutter" campaign.	Continue programs. Investigate potential to reduce amount of hazardous chemicals stored in schools for Science Programs.	2009	No End Date (Continuous)
<b>Water conservation</b>					
Establish a water conservation strategy which includes a plan or policy for replacing water fixtures with efficient models	Not Yet Evaluated				No End Date (Continuous)
Put in place a potable water management strategy to reduce potable water demand of building-level uses such as cooling tower equipment, toilet fixtures, etc. and landscape features	In Development	Opening of new Environmental Learning Centre at Outdoor School to pilot use of grey water for plumbing fixtures.	Learn from pilot at Environmental Learning Centre. Consider related applications at NV Outdoor school	2012	No End Date (Continuous)
Introduce a stormwater management landscape strategy (e.g., vegetated roofs, permeable paving, rain gardens, bioswales)	Ongoing/In Progress	Stormwater management strategies have been included in all new projects since 2008, including Westview, Sutherland, Highlands, Ridgeway, Carson Graham, and ESC/AFK	Stormwater management strategy is included in plans for Queen Mary Elementary	2008	No End Date (Continuous)

**School District 44 - North Vancouver  
Greenhouse Gas Emissions by Source  
for the 2012 Calendar Year (tCO<sub>2</sub>e\*)**



**Total Emissions: 4,903**

- Mobile Fuel Combustion (Fleet and other mobile equipment)
- Stationary Fuel Combustion (Building Heating and Generators) and Electricity
- Supplies (Paper)

**Offsets Applied to Become Carbon Neutral in 2012 (Generated May 28, 2013 3:54 PM)**

Total offsets required: **4,821**. Total offset investment: **\$120,525**. Emissions which do not require offsets: **82** \*\*

\*Tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e) is a standard unit of measure in which all types of greenhouse gases are expressed based on their global warming potential relative to carbon dioxide.

\*\* 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.