

# CARBON NEUTRAL ACTION REPORT 2015



## Executive Summary

The Delta School District is committed to fostering policies, practices and educational programs which will protect and preserve the environment. In addition to hardware projects, where inefficient equipment was replaced with more efficient equipment, the District had launched several conservation behavioural programs and plan to continue these in the future.

In 2015, Delta School District:

- Replaced high bay shop lighting fixtures with LED fixtures that have lower power density but more lumen output
- Virtualized servers
- Installed weather stripping on all exterior doors
- Removed computer labs consisting of computer towers and CRT monitors
- Replaced a rooftop unit with a high efficiency air source heat pump with auxiliary gas
- Installed occupancy sensors for HVAC
- Replaced exterior light fixtures with LED fixtures that have lower power density but more lumen output
- Re-launched behavioural programs that involve students and staff
- Re-launched the Energy Conservation Grant Program
- Continued with the BC Hydro Workplace Conservation Awareness (WCA) Program
- Conducted a custodial workshop to discuss energy conservation from the operations perspective

For the year of 2015, the District's carbon footprint was 2,249 tCO<sub>2e</sub> with 73 tCO<sub>2e</sub> exempt from offsets. Compared to 2010 (baseline year), the CO<sub>2</sub> levels were reduced by 46.4% even though Heating Degree Days (HDD) decreased by only 2.8%.

We are pleased to present the following report on our pursuit of becoming carbon neutral.



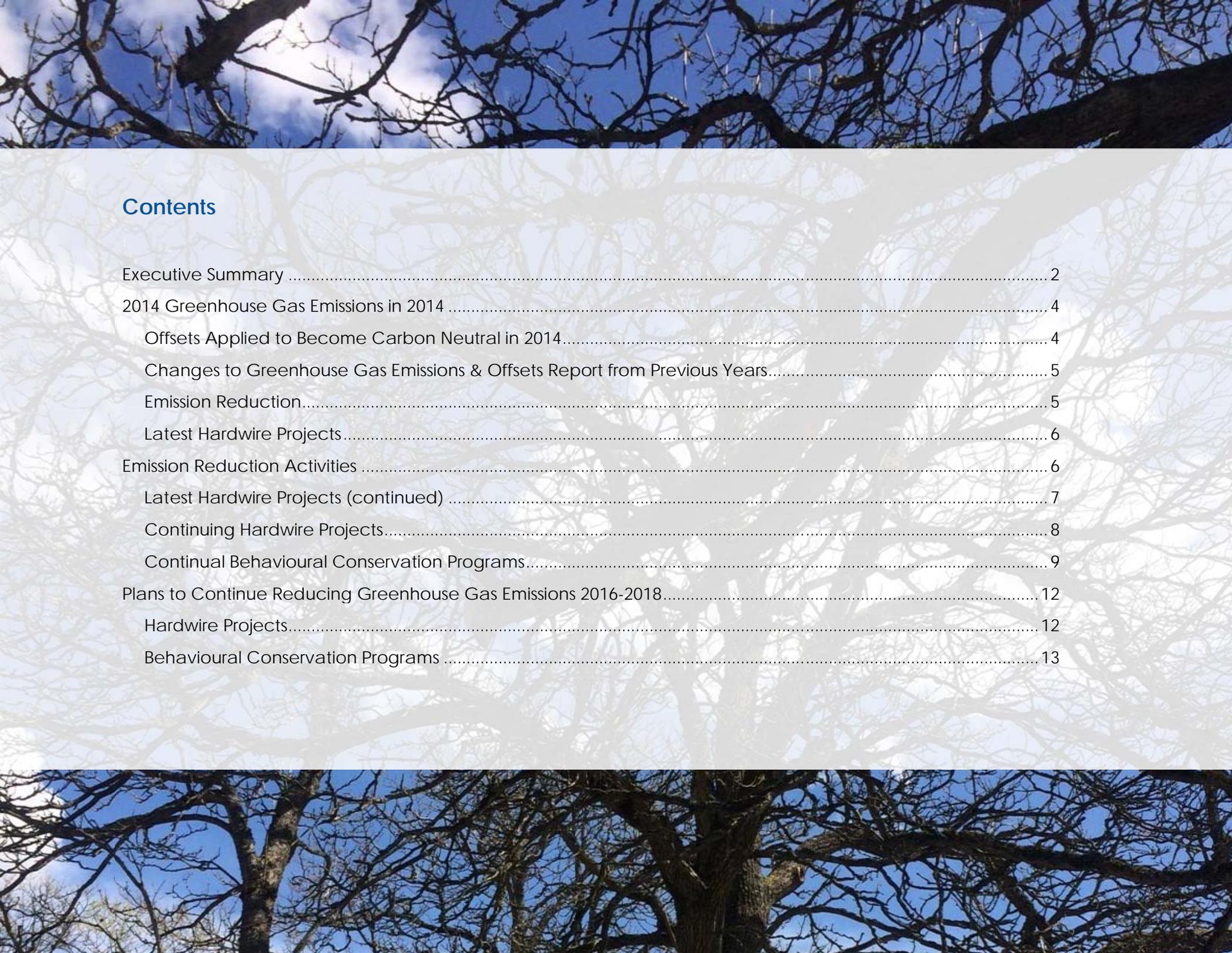
Dianne Turner  
Superintendent of Schools



Frank Geyer, P. Eng, FMA  
Director of Facilities & Planning



Debra Eng, P. Eng, LEED AP  
Energy Manager, Project Engineer



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## 2015 Greenhouse Gas Emissions in

Table 1 Greenhouse Gas Emissions Breakdown from SmartTool

Emission Source	2015 (tCO <sub>2</sub> e)	2014 (tCO <sub>2</sub> e)	2013 (tCO <sub>2</sub> e)	2012 (tCO <sub>2</sub> e)	2011 (tCO <sub>2</sub> e)	2010 (tCO <sub>2</sub> e)
Buildings						
Electricity	87.54	94.35	141.8	233.3	243.4	247.68
Natural Gas & Propane	1,743.79	2,019.0	2,520.1	2,871.1	3,269.4	2,983.68
Fleet						
Gasoline, Propane & Diesel	215.17	360.25	452.4	378.3	367.1	359.69
Biodiesel		51*	13.2	30.6	36.0	32.51
Office Paper	202.05	196.55	216.4	219.3	167.2	437.23
Exempt	-73	-51				
<b>Total Emissions</b>	<b>2,176</b>	<b>2,619</b>	<b>3,343.9</b>	<b>3,732.5</b>	<b>4,083.1</b>	<b>4,060.78</b>

\*Offset Exempt

## Offsets Applied to Become Carbon Neutral in 2015

In 2015, the Delta School District produced a total of 2,249 tonnes of CO<sub>2</sub>e from all sources covered as reported in SmartTool. Based on the summary report provided by SmartTool, 73 tonnes of CO<sub>2</sub>e are “Offset Exempt” where the total offset amount is 2,176 tonnes of CO<sub>2</sub>e. Out-of-Scope Emissions include refrigerants estimated to be less than 1 percent of the District’s emissions. The value was estimated from the refrigerant recharge amounts of R-134a and R-404a (HFCs) in the year of 2015. The emissions from refrigerants are deemed to be out of scope and have not been included in the total District greenhouse gas emissions profile.

Table 2 Greenhouse Gas Emissions Comparison to Baseline

Emissions to Offset	2015 (tCO <sub>2</sub> e)	2014 (tCO <sub>2</sub> e)	2013 (tCO <sub>2</sub> e)	2012 (tCO <sub>2</sub> e)	2011 (tCO <sub>2</sub> e)	2010 (tCO <sub>2</sub> e) Baseline
Total Emissions	2,176	2,619	3,343.9	3,732.5	4,083.1	4,060.8
Compare Offsets to 2010 baseline	-46.4%	-35.9%	-18%	-8%	+1%	0%
Heating Degree Days (HDD)	1,896	2,003	2,193	2,233	2,235	1,952
Compare Heating Degree Days (HDD) to 2010 baseline	-2.8%	+2.6%	+12.3%	+14.4%	+19.1%	0%



## Changes to Greenhouse Gas Emissions & Offsets Report from Previous Years

Based on, heating degree days in Delta increased sharply in 2011 but has returned to 2010 levels in 2015. While HDD in the past 5 years have varied, the District's emissions have remained on a steady decline. In 5 years, the District has been able to reduce carbon offsets by 35.9% at a very similar HDD.

### Emission Reduction

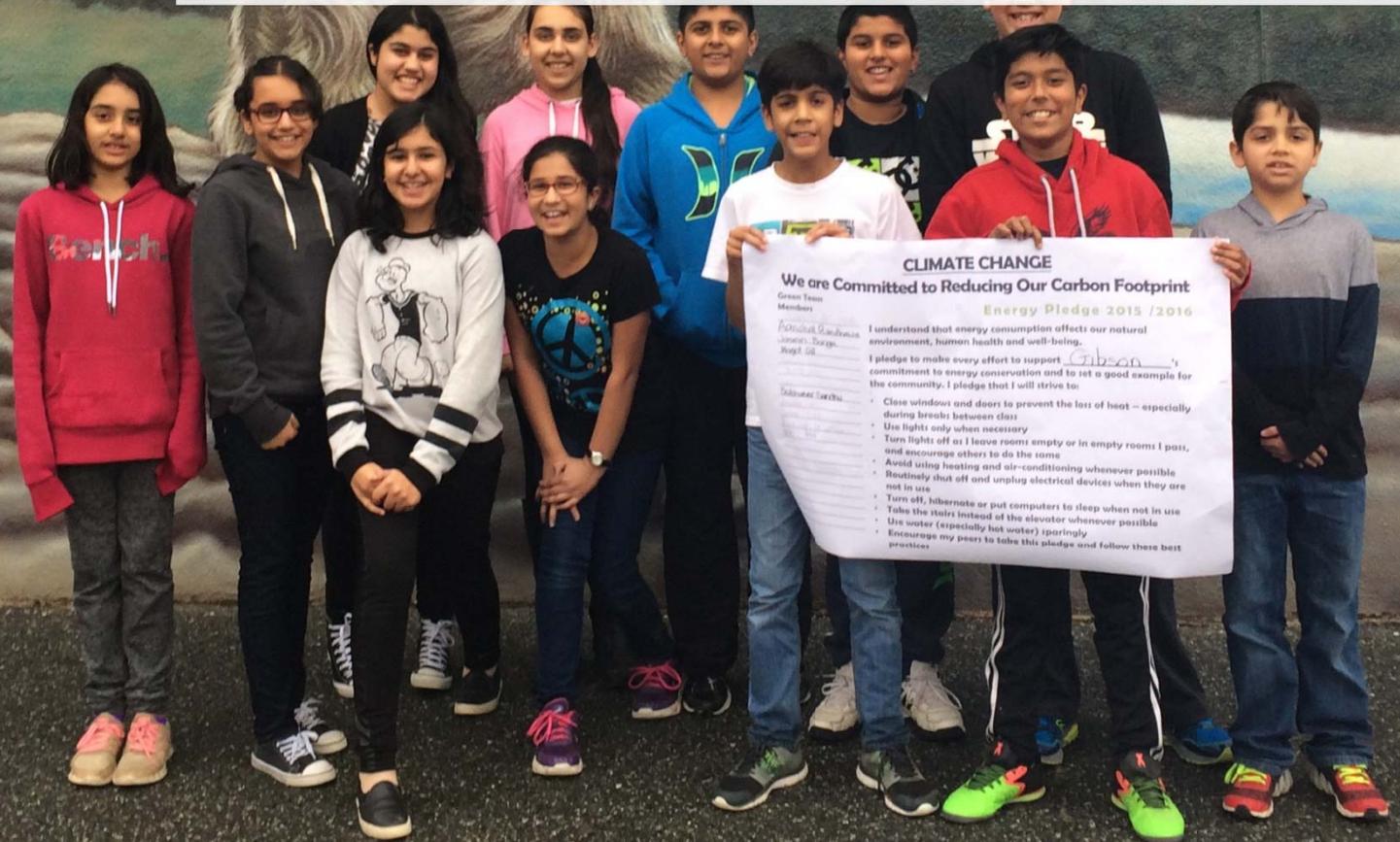
Emission Source	2015 (tCO2e)	2010 (tCO2e)	2015 vs 2010
<b>Buildings</b>			
Electricity	87.54	247.68	-64.7%
Natural Gas & Propane	1,743.79	2,983.68	-41.6%
<b>Fleet</b>			
Gasoline, Propane & Diesel	215.17	359.69	-40.2%
Biodiesel		32.51	-100.0%
Office Paper	202.05	437.23	-53.8%
Exempt	-73		
<b>Total Emissions</b>	<b>2,176</b>	<b>4,060.79</b>	<b>-46.4%</b>

## Emission Reduction Activities

For more than 20 years, the Delta School District has been striving to reduce our carbon footprint through countless projects ranging from fine-tuning equipment operation to replacing rooftop units and lighting fixtures. In addition to hardware replacement programs, the District has continued to encourage resource conservation within the schools as well as in the home.

## Latest Hardware Projects

<i>Replace High Bay Shop lighting</i>	Many of the shop classroom lighting fixtures were 1'x4' fluorescent type fixtures consisting of 2 – 30W lamps. The fixtures were replaced with fixtures with high efficient, LED fixtures that output 4-6 times more light than the original fixtures. We modified the configuration of the fixtures in the shops for improved lighting levels.
<i>Server Virtualization</i>	As part of an overall Active Directory Project, the District was able to remove 80 servers through virtualization and redundancy elimination.
<i>Removed Computer Labs</i>	The District has been working toward implementing portable computer labs where laptops are stationed on carts that move from classroom to classroom. Prior to the portable lab implementation, the old computer labs consisted of computer towers with CRT monitors. Computer labs were left on between classes while the laptops are turned off and reloaded on to the carts between classes.



## Latest Hardwire Projects (continued)

*New HVAC unit at Delta Secondary School* The previous make-up air unit serving two classroom spaces at Delta Secondary was a gas fired unit. The unit was replaced with a high efficiency air source heat pump with auxiliary gas.

*Heat Pump Heating Plant Optimization* Air to Water Heat Pumps and Ground Source Heat pumps have been installed at 11 District sites to provide hydronic heating throughout the buildings. Sites include elementary schools, secondary schools and administrative buildings that have the highest savings opportunity. The operation of the heating plants has been and still is being analyzed for optimum performance. Building operation variables among many external variables are incorporated into the sequence of operation. Implementation of these plants has been the largest contributor in reducing our greenhouse gas emissions over the past few years.

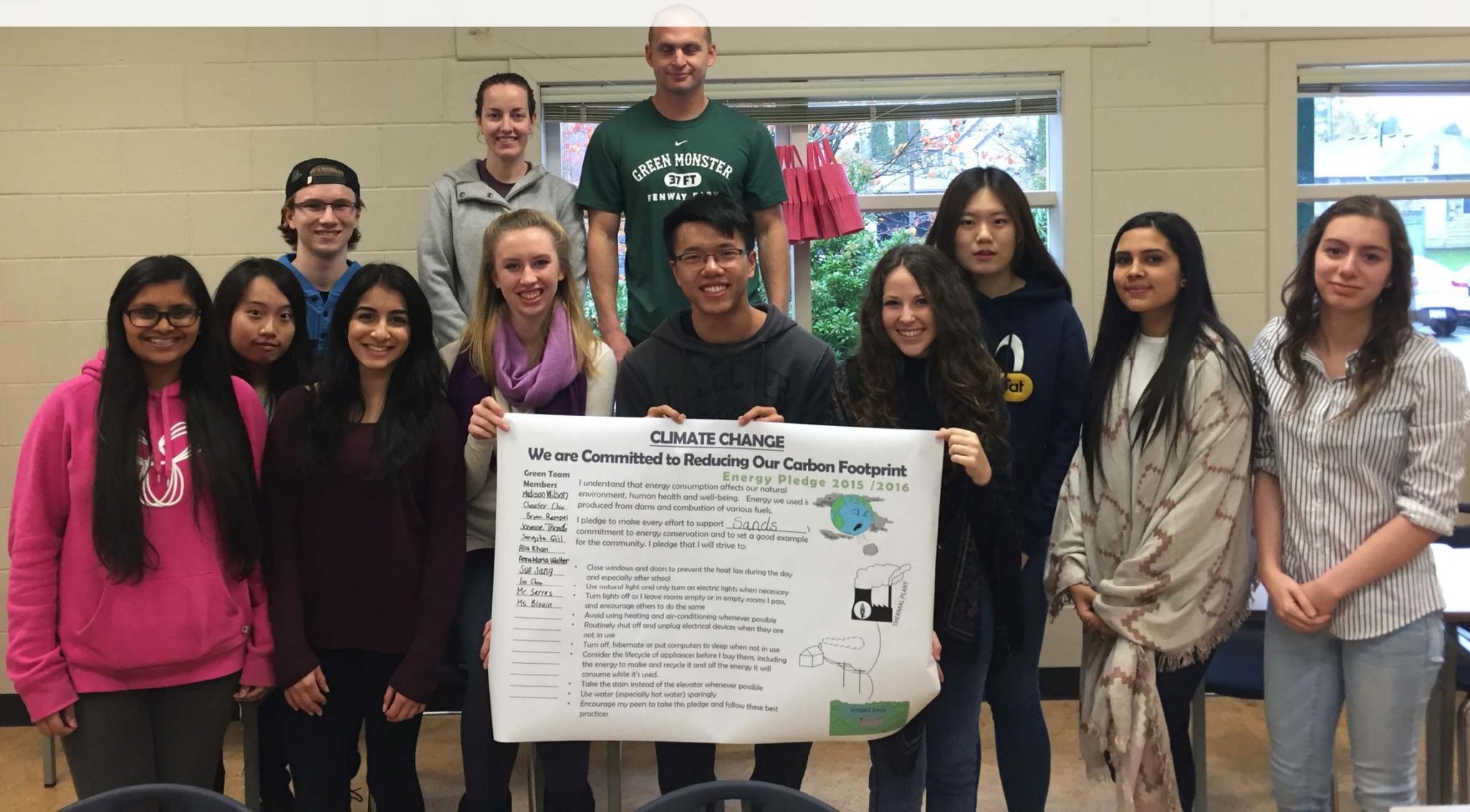
*Weather Stripping* The District installed new weather stripping around doors at all sites. This would reduce heat-loss and drafts in the building. The weather stripping also mitigates rodents from entering the building.



## Continuing Hardwire Projects

**Occupancy Sensors for HVAC** The original HVAC programming involved the outdoor air damper position modulate based on a schedule and outdoor air temperature. Occupancy sensors were installed and connected to DDC system. The DDC system would close the outdoor air damper when the room is not occupied. This would limit need to heat outdoor air for ventilation when the classroom is occupied. The occupancy sensors are also used as an input for load shedding with sites using ASHPs. This upgrade has been implemented at 5 sites at the moment and planned for more in the near future.

**Building Exterior Lights** The District is continually replacing HID (high intensity discharge) and HPS (high pressure sodium) area lighting with lower power input induction and LED (light emitting diode) lighting units. The lighting output from the new units is higher than or equal to the original units that had higher power inputs. This upgrade has been completed at half of the schools, with installation at the remaining schools planned for the following year.



## Continual Behavioural Conservation Programs

*Re-launched behavioural programs that involve students and staff*

The Delta School District has a very strong group of sustainability leaders ranging from students to the Superintendent of Schools and Board Chair. The Delta Green Committee was reinstated in 2014. The committee consists of representatives of each stakeholder group: students, teachers, principals, vice-principals, executives and facilities management. The committee has revitalized the Sustainability Policy/Procedure with input from all members and with consideration from all perspectives and interpretation. The committee brings forward sustainability projects and issues where input from the group is vital to speedy completion and resolution

*Sharing with the District*

In participation with a BC Hydro Workplace Conservation Program, the District has been using newsletters, blogs, Facebook and Twitter in collaboration with the District's communication manager to share information on upcoming sustainability activities and reporting of the success of the activities. The performance of the social media posts is tracked by visits, likes and re-posts.

*Sweater Day Challenge*

The Superintendent's office issued a challenge to all the other school districts in the Lower Mainland to reduce the temperature at their administrative buildings and running a sweater event. The board office, maintenance office and education centre at the Delta School District all participated and turned the temperature down by 2°C.

*Custodial Workshop*

The District held an energy conservation workshop with the custodians. There was an update of what the District's energy reduction plan. Round tables with custodial feedback were conducted during the second half of the workshop. Custodians were asked about what their experiences were regarding teachers unplugging appliances, closing windows and how the topic is discussed between school staff and custodians. After the workshop, the custodians completed an appliance audit for a thorough inventory of what appliances are found in the school. The data would be used to determine the best steps towards an awareness campaign and reducing the number of appliances in the District.





*Energy Conservation Grant*

The annual Energy Conservation Grant was offered again to all sites.

An Energy Conservation Grant was available to each school for when they participate in the program. As the activities were geared towards energy conservation, the grant was funded from the utility budget. The program included:

- Phase 1: Creating a Green Team, committing to the energy conservation pledge and presenting the school's commitment to staff and students. The pledges were posted on the wall near the entrance of the school to declare commitment to conservation to any visitors.
- Phase 2: Incorporation of a BC Hydro Energy Saving Kiosk into a school program, Sweater Days, Energy Audits that Lead to Action, Remove All Non-District Issued (power consuming) Equipment, Innovative Activity, etc.
- Phase 3: Present the team's activity throughout the year and submit a plan for the following year.

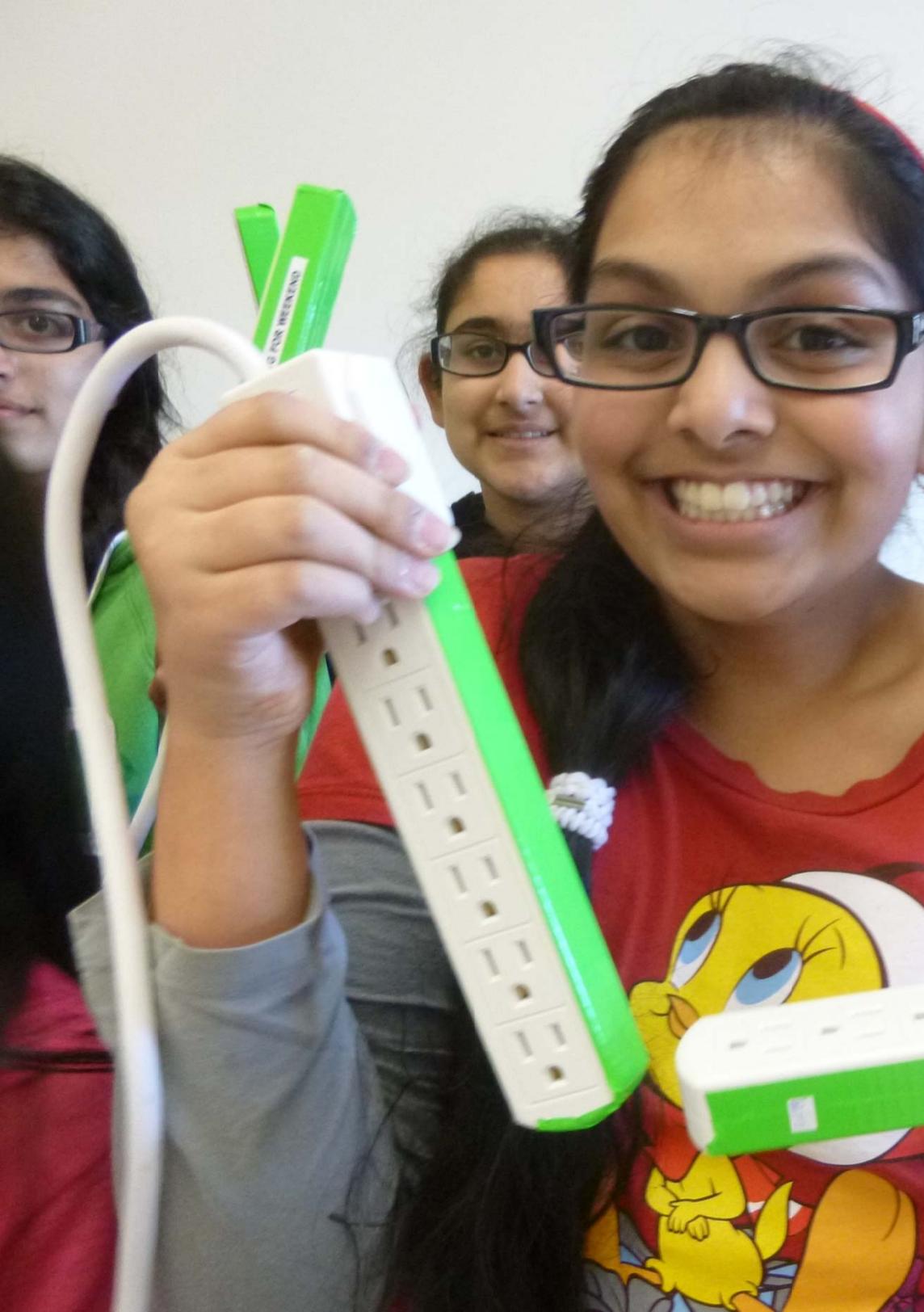
Each activity has been assigned a grant dollar value and the schools were rewarded after photos of the activities were submitted for use in the District social media.



*BC Hydro  
Workplace  
Conservation  
Awareness  
(WCA)  
Program*

Delta School District participated in a BC Hydro pilot program called the Workplace Conservation Awareness Program (WCA). All schools participated in the program. There were two main objectives:

- Create a strong sustainability community within each school
  - Support leadership of energy champions
  - Use the existing District intranet as a tool for online collaboration
  - Recognize strategies for sites participating
- Incorporate Plug Load into sustainability consciousness
  - Marketing campaigns
  - Promote energy conservation practices to groups that rent District space
  - Integrate new energy dashboard technology to monitor energy use at each site



## Plans to Continue Reducing Greenhouse Gas Emissions 2016-2018

### Hardwire Projects

<i>Paper Reduction Campaign</i>	The Delta Green Committee is looking at a methods and/or campaigns that would reduce the usage of paper (non-recycled) paper in the district.
<i>Gym Lighting</i>	The next step moving towards energy efficient equipment involves replacement of gym lighting. The District is looking at replacing fixtures with LED, induction or any other technology with longer life than the fluorescent fixtures installed. This would reduce the need to bring in lifts to reach the fixtures for maintenance in addition to energy savings.

## Behavioural Conservation Programs

### *Removing appliances*

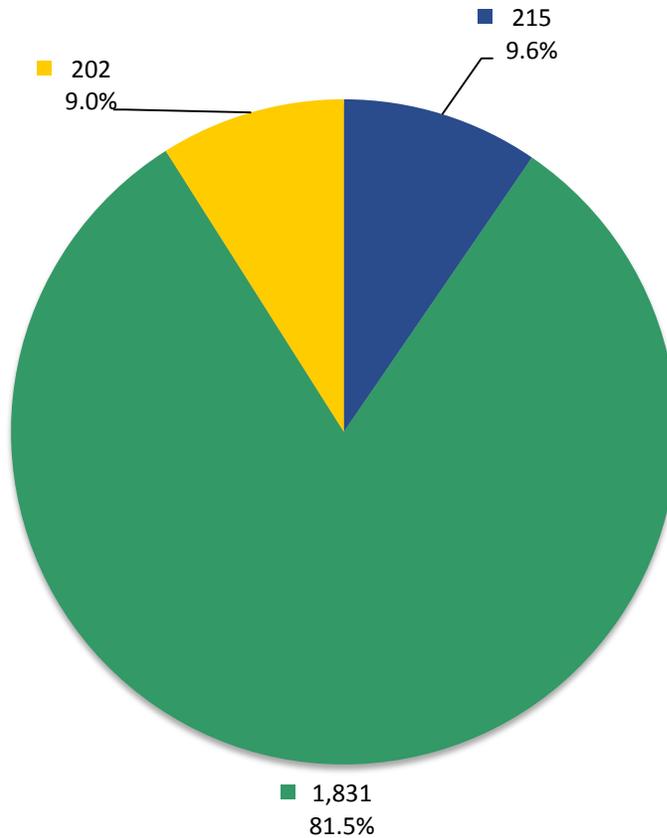
In collaboration with the custodians throughout the District, an inventory of all appliances was taken. With this information, the Delta Green Committee has decided to start with discussions with staff by asking everyone to take a look at what is really needed and remove appliances from the schools if it is not needed. The District wants to make it easier for the staff to remove the appliances from their classrooms, pallets for equipment to be removed will be offered towards the end of the school year. The effectiveness of the campaign will determine if further action would be required.



## Totals Calendar Year 2015, School District 37 - Delta

	Measure	Quantity	Greenhouse Gases in Tonnes				tCO <sub>2</sub> e <sup>1</sup>
			CO <sub>2</sub>	BioCO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	
<b>Scope 1 (Direct) Emissions</b>							
Mobile Combustion (Fleet)	Litres	85,580.00	198.67	7.06	0.01	0.03	215.17
Stationary Combustion, Reported <sup>3</sup>	GigaJoules	34,984.67	1,733.23	0.00	0.03	0.03	1,743.79
<b>Scope 2 (Indirect) Emissions</b>							
Purchased Energy, Reported <sup>3</sup>	GigaJoules	31,265.48	87.54	0.00	0.00	0.00	87.54
<b>Scope 3 (Business Travel and Office Paper) Emissions</b>							
Office Paper	Packages	30,827.00	202.05	0.00	0.00	0.00	202.05
<b>Total Emissions, Calendar Year 2015</b>			<b>2,221.51</b>	<b>7.06</b>	<b>0.05</b>	<b>0.06</b>	<b>2,249</b>
<b>Carbon Neutral or Offset Exempt</b>			<b>63.75</b>	<b>7.06</b>	<b>0.00</b>	<b>0.01</b>	<b>73</b>
<b>Total for Offsets<sup>4</sup></b>			<b>2,157.75</b>	<b>0.00</b>	<b>0.05</b>	<b>0.06</b>	<b>2,176</b>

**School District 37 - Delta  
Greenhouse Gas Emissions by Source  
for the 2015 Calendar Year (tCO<sub>2</sub>e\*)**



**Total Emissions: 2,249**

- 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 2015 (Generated May 26, 2016 9:05 AM)**

Total offsets required: **2,176**. Total offset investment: **\$54,400**. Emissions which do not require offsets: **73** \*\*

\*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.

# 2015 Carbon Neutral Action Report Survey

Organization Name:

*Delta School District*

Please select your sector:

- School District

1) Stationary Sources (Buildings, Power Generators, Ext. Lighting) Fuel Combustion, Electricity use, Fugitive Emissions:

Please indicate which actions your PSO took in 2015:

Have developed an overall strategy/plan to reduce energy use in your organization's buildings inventory:

*Yes*

If Yes, please describe:

*We have renew our strategic energy management plan on an annual basis. The plan involves the assessment of all the buildings and are compared with each other based on type of usage. There is also a project list at varying stages.*

Undertook evaluations of building energy use:

*Yes*

Performed energy retrofits on existing buildings:

*Yes*

Built or are building new LEED Gold or other "Green" buildings:

*No*

Please list any other actions, programs or initiatives that your organization has introduced that support emissions reductions from buildings:

*Behavioural programs on resource conservation using campaigns and contests along with the workplace conservation awareness program offered by BC hydro.*

2) Mobile Sources (Fleet, Off-road/Portable Equipment) Fuel Combustion:

Indicate which actions your PSO took in 2015:

Have put in place an operations policy/program to support systematic reductions in fleet related emissions:

(e.g., program to convert fleet to renewable fuels)

*No*

If Yes, please describe:

*(No response)*

Replaced existing vehicles with more fuel efficient vehicles (gas/diesel):

*Yes*

Replaced existing vehicles with hybrid or electric vehicles:

*No*

Took steps to drive less than previous years:

*No*

Please list any other actions, programs or initiatives that your organization has introduced that support emissions reductions from fleet combustion:

*(No response)*

3) Supplies (Paper):

Indicate which actions your PSO took in 2015:

Have put in place an operations policy/program to facilitate a systematic reduction in paper-related emissions:

(e.g., policy to purchase 100% Recycled Content; default to double-sided printing)

*No*

If yes, please describe:

*(No response)*

Have put in place an operations policy/program to facilitate behavioural changes from paper use:

(e.g. awareness campaign to reduce paper use):

*No*

If yes, please describe:

*(No response)*

Used only 100% recycled paper:

*No*

Used some recycled paper:

*Yes*

Used alternate source paper:

(e.g., bamboo, hemp, wheat etc.)

*No*

Please list any other actions, programs or initiatives that your organization has introduced that support emissions reductions from paper supplies:

*We have initiated an awareness campaign that shares how much each school has used since the beginning of the school year and equating it to numbers of trees.*

4) Other Sustainability Actions:

Please note that this section is optional

Business Travel

Created a low-carbon travel policy or travel reduction goal:

(low-carbon = lowest emission of greenhouse gas per kilometer per passenger)

*No*

Encouraged alternative travel for business:

(e.g. bicycles, public transit, walking)

*Yes*

Encouraged or allow telework/working from home:

*Yes*

Other:

*(No response)*

Education Awareness

Have a Green/Sustainability/Climate Action Team:

*Yes*

Supported green professional development:

(e.g. workshops, conferences, training)

*Yes*

Supported or provided education to staff about the science of climate change, conservation of water, energy and/or raw materials:

*No*

Other:

*(No response)*

## Adaptation Planning for Climate Risks

Have assessed whether increased frequency of extreme weather events and/or long term changes in climate will affect your organization's infrastructure, its employees and/or its clients:

*No*

Have incorporated these anticipated changes in climate into your organization's planning and decision making:

*No*

Other:

*(No response)*

## Other Sustainability Actions

Established a water conservation strategy which includes a plan or policy for replacing water fixtures with efficient models:

*No*

Have put in place an operations policy/program to facilitate the reduction and diversion of building occupant waste stream from landfills or incineration facilities:

(e.g., composting, collection of plastics, batteries)

*Yes*

Established green standards for goods that are replaced infrequently and/or may require capital funds to purchase:

(e.g., office furniture, carpeting, etc.)

*No*

Incorporated lifecycle costing into new construction or renovations:

*Yes*

Please list any other sustainability actions your organization has taken not listed above:

*(No response)*