

# CARBON NEUTRAL ACTION REPORT

## CLIMATE CHANGE - We are Committed to Reducing Our Carbon Footprint

Energy Pledge 2013/2014

Green Team  
Members

I understand that energy consumption affects our natural  
environment, human health and well-being.

I pledge to make every effort to support  
commitment to energy conservation and to set a good example  
for the College community. I pledge that I will strive to:

- Use lights when necessary.
- Turn lights out as I leave rooms empty or in empty rooms I  
pass, and encourage others to do the same.
- Close windows and doors to prevent the loss of heat.
- Avoid using heating and air conditioning whenever possible.
- Routinely shut off and unplug electrical devices when they are  
not in use.
- Turn off, hibernate or put to sleep computers when they are  
not in use.
- Limit the number of loads of laundry I do and get the dryer  
full.
- Take the stairs instead of the elevator whenever possible.
- Use water (especially hot water) sparingly.
- Avoid driving personal vehicles whenever possible.
- Encourage my peers to take this pledge and follow their best  
practices.

Sophia, Blane,  
Chayen, Kim,  
Sun, Lee,  
T. Frank, etc.

## 2014



## 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 renewed the Sustainability Policy with a Sustainability Procedure.

In 2014, Delta School District:

- Replaced Classroom Light Fixtures with Fixtures with Lower Power Density but More Lumen Output
- Shut down HVAC Equipment During Teacher Job Action
- Removed Computer Labs Consisting of Computer Towers and CRT Monitors
- Replaced a Make-up Air Unit at Delta Secondary School
- Arranged for Re-Programming of Geo-exchange Heating Plants Controls to Improve Efficiency
- Re-Programmed the Building Automation System
- Installed Occupancy Sensors for HVAC
- Replaced Outdoor Parking Lot and Building Exterior Lights
- Re-launched Behavioural Programs that Involve Students and Staff
- Ran a Poster Contest with 3 Themes: Energy Conservation, Water Conservation and Waste Reduction
- Re-Launched the Energy Conservation Grant Program
- Introduced an Energy Conservation Social Media Pilot with the Assistance from BC Hydro Consultant
- 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 2014, the District's carbon footprint was 2,670 tCO<sub>2</sub>e with 51 tCO<sub>2</sub>e exempt from offsets. Compared to 2013, the CO<sub>2</sub> levels were reduced by 21.6% even though Heating Degree Days (HDD) decreased by only 7%. Compared to 2010, CO<sub>2</sub> levels have reduced by 35.9%.

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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## 2014 Greenhouse Gas Emissions in 2014

Table 1 Greenhouse Gas Emissions Breakdown from SmartTool

Emission Source	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	94.35	141.8	233.3	243.4	247.68
Natural Gas & Propane	2,019.0	2,520.1	2,871.1	3,269.4	2,983.68
Fleet					
Gasoline, Propane & Diesel	360.25	452.4	378.3	367.1	359.69
Biodiesel	51*	13.2	30.6	36.0	32.51
Office Paper	196.55	216.4	219.3	167.2	437.23
<b>Total Emissions</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 2014

In 2014, the Delta School District produced a total of 2,663 tonnes of CO<sub>2</sub>e from all sources covered as reported in SmartTool. Based on the summary report provided by SmartTool, 51 tonnes of CO<sub>2</sub>e are "Offset Exempt" where the total offset amount is 2,612 tonnes of CO<sub>2</sub>e. Out-of-Scope Emissions include refrigerants estimated to be 26.1 tCO<sub>2</sub>e which is 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 2014. 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	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	2,619	3,343.9	3,732.5	4,083.1	4,060.8
Compare Offsets to 2010 baseline	-35.9%	-18%	-8%	+1%	0%
Heating Degree Days (HDD)	2,577	2,765	2,864	2,962	2,576
Compare Heating Degree Days (HDD) to 2010 baseline	0%	+7%	+11%	+15%	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 2014. While HDD in the past 5 years have varied, the District's emissions have remained on a steady decline. In 5 years, the school district has been able to reduce carbon offsets by 35.9% at a very similar HDD.

### Emission Reduction

Emission Source	2014 (tCO <sub>2</sub> e)	2013 (tCO <sub>2</sub> e)	2014 vs 2013
Buildings			
Electricity	94.35	141.8	-33.5%
Natural Gas & Propane	2,019.00	2,520.1	-20.1%
Fleet			
Gasoline, Propane & Diesel	360.25	452.4	-20.4%
Biodiesel	51	13.2	286.9%
Office Paper	196.55	216.4	-9.2%
<b>Total Emissions</b>	<b>2,619</b>	<b>3,343.9</b>	<b>-21.6%</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 hardwire replacement programs, the District has continued to encourage resource conservation within the schools as well as in the home.

## Latest Hardwire Projects

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### *Replace Classroom Light Fixtures*

Many of the classrooms lighting fixtures were 1'x4' fluorescent type fixtures consisting of 2 – 28W lamps. The fixtures were replaced with fixtures with high reflectance paint, single lamp per fixture and with the master/slave configuration on 75% of the fixtures, which led to half the number of ballasts and lamps.

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### *Shutdown HVAC Equipment During of Typical Schedule*

During the 2014 teacher job action, the Direct Digital Control (DDC) System calendars were modified to compensate for the unoccupied spaces. As the classrooms were not being used, there was no need to heat them up to the occupied setpoint. The buildings remained in night setback mode during the day.

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### *Removed Cccomputer Labs*

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.

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Latest Hardwire Projects (continued)

*New makeup air unit at Delta Secondary School*

The previous make-up air unit serving the cafeteria commercial kitchen at Delta Secondary was a gas fire indirect unit. The unit was replaced with a high efficiency condensing type make up air unit. The purchase of the unit was subsidized by a Fortis BC rebate and the operation and performance has been monitored by Fortis BC's consultant as a pilot program to determine the feasibility of a condensing make-up air unit rebate program. The pilot program will conclude by the spring of 2015 and report by Fortis BC may be complete by spring of 2016.

*Geo-exchange Heating Plants*

Geo-exchange thermal energy systems have been installed at nine 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.





## Continuing Hardwire Projects

### *Building Automation System Recommissioning*

The Direct Digital Control (DDC) System has been operational within the District for many years. There have been additions, modification and repairs. \_Recommissioning includes:

- Renaming equipment names and points to a consistent naming convention throughout the District for ease in maintenance call responses
- Ensuring all sensors, including temperature sensors, occupancy sensors, etc., are all operational and calibrated
- Incorporating occupancy sensors to reduce outdoor air when room is unoccupied
- Adjusting heat pump/auxiliary gas switchover temperature to maximize efficiency

### *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 3 sites at the moment and planned for more in the near future.

### *Outdoor Parking Lot and Building Exterior Lights*

The District is continually replacing HID (high intensity discharge) 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 and installation at the remaining schools are planned for the following year.





## Continual Behavioural Conservation Programs

<i>Re-launched behavioural programs that involve students and staff</i>	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 for the 2014/2015 school year. 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
<i>Poster contest</i>	Students participating in their secondary school green teams wanted to get a head start on their green activities during the 2014 teacher job action. The students were ready with their first District-wide conservation campaign when school was back in session. They approached the Corporation of Delta for collaboration in a public service awareness poster campaign around sustainability issues in three areas: Energy Management, Waste Management, and Water Conservation. The poster winners each won a bicycle helmet and their names were put into a draw for the grand price of a \$400 gift card for a new bicycle. The posters were duplicated and distributed throughout the District and municipal buildings with one theme per season.
<i>Social media pilot and continuation in information sharing with the District</i>	In participation with a BC Hydro Social Media Pilot 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 are tracked by visits, likes and re-posts.





## 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 (left) 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.
- 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.







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*BC Hydro  
Workplace  
Conservation  
Awareness  
(WCA) Program*

For the school years 2013/2014, the Delta School District participated in a BC Hydro pilot program called the Workplace Conservation Awareness Program (WCA). Nine 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

The BC Hydro program administrative requirements were completed for the nine sites but the same conservation measures were applied to schools other than the original nine. As mentioned in the previous greenhouse gas emissions summary, the results are positive. For the following year, the District plans to increase the number of participating sites by 2-3.

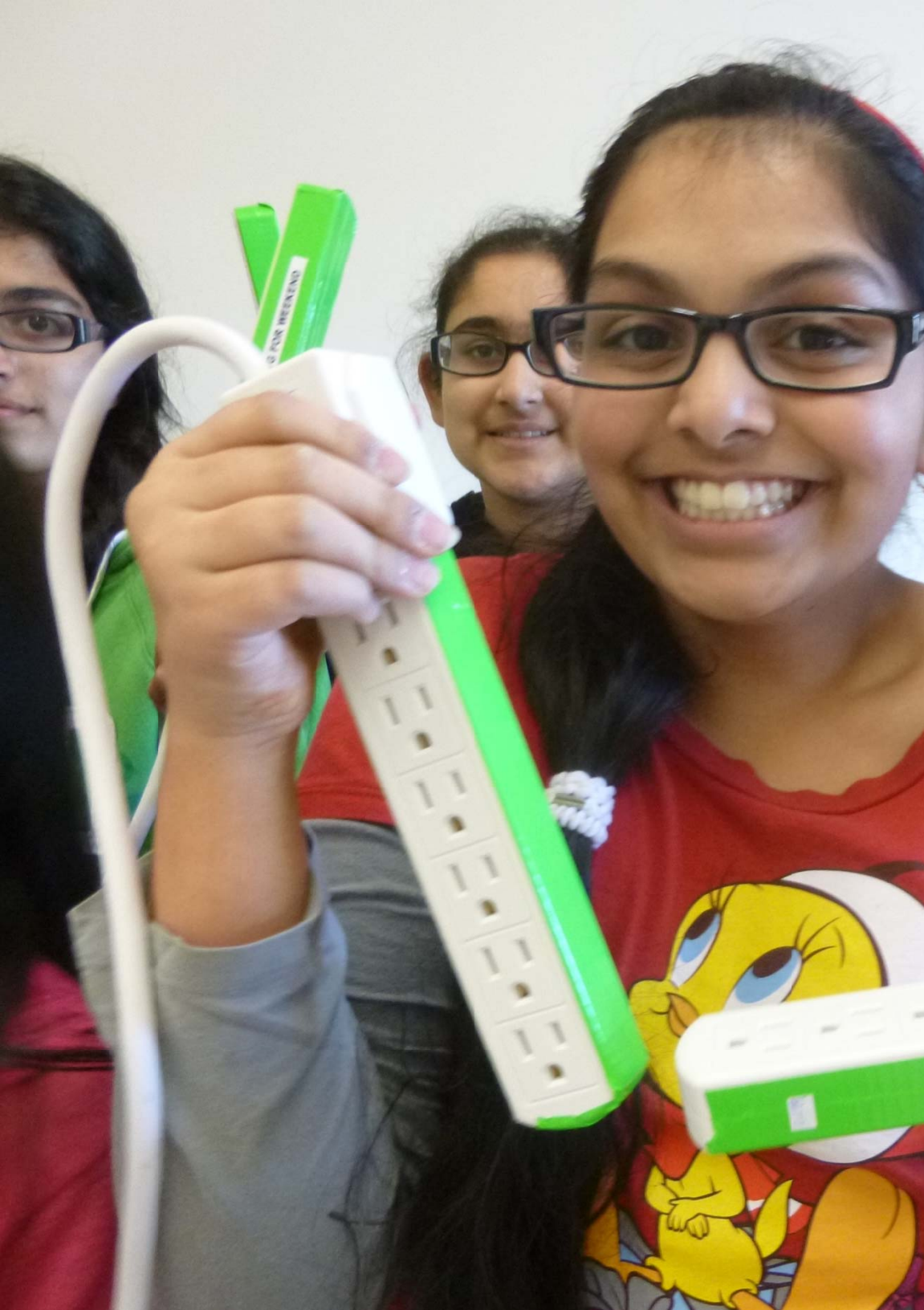
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*Custodial  
Workshop*

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.

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## Plans to Continue Reducing Greenhouse Gas Emissions 2015-2017

### Hardwire Projects

*Online meeting* The District is looking at software that allows meetings to occur online and minimize the need for multiple members to commute to one location for a meeting. This would be ideal for administrative meetings, intra-school clubs such as green teams or presentations staff would like to share amongst the schools. One of the difficulties in collaborating between schools is distance. There are three major communities within Delta that are separated by large farmland. This tool would bring the communities together.

*Gym Lighting* 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.

*Weather Stripping* The District will be starting a program to install new weather stripping around doors at all sites. This would reduce heatloss and drafts in the building. The weather stripping would also make it more difficult for rodents to enter the building.



Behavioural Conservation Programs

*Video Contest* In continuing the collaboration with the Corporation of Delta to spread the word about conservation, the District would like to start a new campaign involving students submitting videos of the importance of conservation of energy, water and waste. The Delta Youth Sustainability Network will be leading this contest similar to the Poster Contest in the previous year. The District will continue with the prizes of bicycle helmets and gift certificate towards a bicycle.

*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.



*Sustainability - Independent Directed Studies Course* In attempt to draw secondary school students to the sustainability industry, an independent study course in sustainability is going to be offered to grade 11-12 students with credits that would go toward graduation. This encourages students to participate in sustainability programs in the District as well as learning about the career opportunities available in sustainability.



## Totals Calendar Year 2014, School District 37 - Delta

	Measure	Quantity	Greenhouse Gases in Tonnes				
			CO <sub>2</sub>	BioCO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	tCO <sub>2</sub> e <sup>1</sup>
Scope 1 (Direct) Emissions							
Mobile Combustion (Fleet)	Litres	150,763.70	332.81	10.89	0.04	0.05	360.25
Stationary Combustion, Reported <sup>3</sup>	GigaJoules	40,498.58	2,006.75	0.00	0.04	0.04	2,019.00
Scope 2 (Indirect) Emissions							
Purchased Energy, Reported <sup>3</sup>	GigaJoules	33,697.99	94.35	0.00	0.00	0.00	94.35
Scope 3 (Business Travel and Office Paper) Emissions							
Office Paper	Packages	30,139.00	196.55	0.00	0.00	0.00	196.55
Total Emissions, Calendar Year 2014			2,630.47	10.89	0.08	0.09	2,670
Carbon Neutral or Offset Exempt			38.59	10.89	0.00	0.00	51
Total for Offsets <sup>4</sup>			2,591.88	0.00	0.07	0.09	2,619

1. Each greenhouse gas has been converted to a standard measurement (tCO<sub>2</sub>e) by multiplying its emissions by its global warming potential (GWP). The GWP of carbon dioxide (CO<sub>2</sub>) from both anthropogenic and biogenic sources is 1; methane (CH<sub>4</sub>) is 25, and nitrous oxide (N<sub>2</sub>O) is 298. The Totals for tCO<sub>2</sub>e are shown here rounded to the nearest whole metric tonne as only whole tonnes of tCO<sub>2</sub>e can be purchased for offsets.

2. Estimated data has been calculated based on the methods described in the Methodology Document.

3. Reported data refers to consumption which has been directly billed to the organization.

4. The tCO<sub>2</sub>e value from the "Total for Offsets" line represents the quantity of offset purchases required to become carbon neutral.



# 2014 Carbon Neutral Action Report (CNAR)

## - Part 2 ACTIONS

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### Organization Name

Delta School District SD37

### Actions Taken to Reduce Emissions

#### **1) Stationary Fuel Combustion, Electricity (Buildings):Indicate which actions were taken in 2014:**

Performed energy retrofits on existing buildings

Yes

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

No

Undertook an evaluation of overall building energy use.

Yes

Please list any other actions taken to reduce emissions from Buildings:

Replace equipment for more efficient versions

Encourage conservation of energy, water and waste in the district

#### **2) Mobile Fleet Combustion (Fleet and other vehicles):Indicate which actions were taken in 2014:**

Do you have a fleet?

Yes



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

No

Replaced existing vehicles with hybrid or electric vehicles

No

Reduced the overall number of fleet vehicles

No

Took steps to drive less than last year

No

Please list any other actions taken to reduce emission from fleet:

(No response)

### **3) Supplies (Paper):Indicate which actions were taken in 2014:**

Used less paper than previous year

Yes

Used only 100% recycled paper

No

Used some recycled paper

Yes



Used alternate source paper (Bamboo, hemp, etc.)

No

Please list any other actions taken to reduce emissions from paper use:

Implement login accounts for using the copier in order to keep record of how many times the copier is used under each person's account.

### Page 3

## Actions Taken to Reduce Emissions - continued

Explain how you plan to continue minimizing emissions in 2015 and future years:

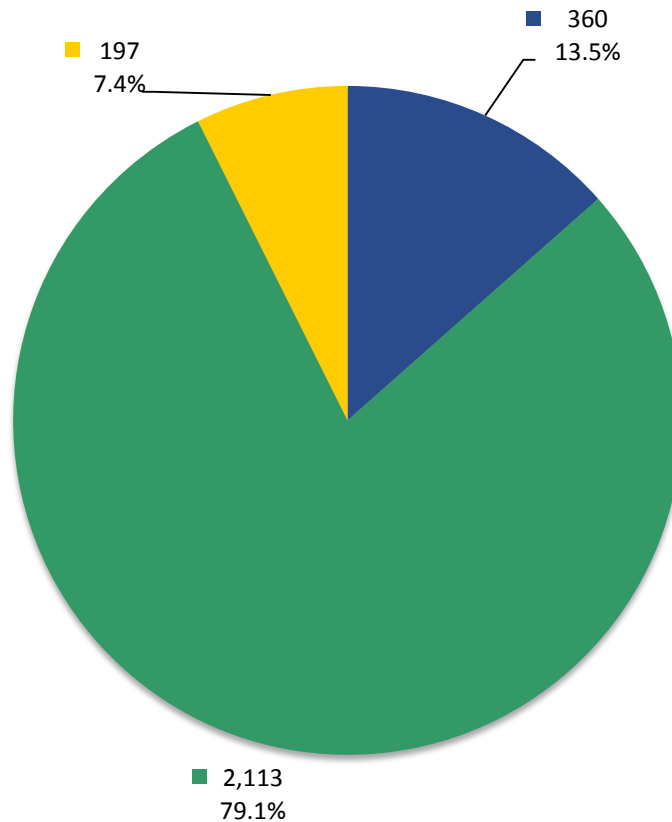
Awareness campaign and data will be shared back to the school

If you wish to list any other "sustainability actions" outside of buildings, fleet, paper and travel check "yes". This reporting is optional.

No



**School District 37 - Delta  
Greenhouse Gas Emissions by Source  
for the 2014 Calendar Year (tCO<sub>2</sub>e\*)**



**Total Emissions: 2,670**

- 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 2014 (Generated June 23, 2015 1:09 PM)**

Total offsets required: **2,619**. Total offset investment: **\$65,475**. Emissions which do not require offsets: **51** \*\*

\*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.