

5/4/2016

2015 Carbon Neutral Action Report



Learning that Enriches the Life
of Each Student

School District No. 57 (Prince George)
PROVINCE OF BRITISH COLUMBIA

Contents

Contents	1
Executive Summary	2
Emissions and Offsets Summary Table / Executive Sign-Off	3
Greenhouse Gas Emissions	4
Emissions Reductions Programs	5
Conclusion	6

2015 Carbon Neutral Action Report

School District No. 57 (Prince George)

This Carbon Neutral Action Report for the period January 1st to December 31st 2015 summarizes our emissions profile, the amount of offsets purchased to reach net zero emissions and the actions we have taken in 2015 to reduce our greenhouse gas emissions.

By June 30, 2016, School District No. 57 (Prince George) will again declare itself to be carbon neutral and this Carbon Neutral Action Report will be posted to our website at www.sd57.bc.ca.

Executive Summary

School District No. 57 (Prince George) has been carbon neutral since 2010.

In 2015 we have continued our efforts to reduce our carbon footprint by;

- upgrading inefficient, atmospheric type gas fired boiler systems with high efficient condensing units
- exchanging lighting systems across the district with those that use half the tubes, ballasts and power of the original and output a greater amount and quality light
- installing occupancy sensors to classrooms and storage areas to reduce wasted electricity
- optimizing the building automations systems to improve operation and reduce energy use
- downsizing our service fleet with more efficient, smaller vehicles

By reducing our gas and electricity consumption we have reduced our carbon footprint. We return these savings for use on more sustainability projects, thereby creating a revolving 'green' fund which will result in further reductions to our carbon emissions and cost savings to the district.

For the year 2015, our District's carbon footprint was 5220 tCO₂e.

We are pleased to present the following report on our efforts to become carbon neutral.

Sharon Cairns
Superintendent
School District No. 57



Barry Beppe
Energy & Sustainable
Conservation Coordinator



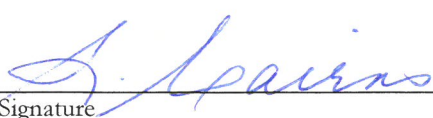
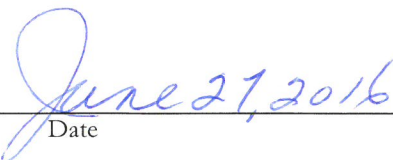


Emissions and Offsets Summary Table:

School District No. 57 (Prince George) GHG Emissions and Offsets for 2015 (TCO2E)	
GHG Emissions created in Calendar Year 2015	
Total Emissions (TCO2E)	5220
Total Offsets (TCO2E)	5207
Adjustments to GHG Emissions Reported in Previous Years	
Total Emissions (TCO2E)	0
Total Offsets (TCO2E)	0
Total Emissions for Offset for the 2015 Reporting Year	
Total Offsets (TCO2E)	5207

Retirement of Offsets:

In accordance with the requirements of the Greenhouse Gas Reduction Targets Act and Carbon Neutral Government Regulation, School District No. 57 (the Organization) is responsible for arranging for the retirement of the offsets obligation reported above for the 2015 calendar year, together with any adjustments reported for past calendar years. The Organization hereby agrees that, in exchange for the Ministry of Environment ensuring that these offsets are retired on the Organization's behalf, the Organization will pay the associated invoice to be issued by the Ministry in an amount equal to \$25 per tonne of offsets retired on its behalf plus GST.

Executive sign-off:

 Signature	 Date
 Name	 Title

2015 Greenhouse Gas Emissions

For the 2015 calendar year, School District No. 57's greenhouse gas emissions (GHG) were 5,220 tonnes of CO₂e.

The following summarizes the greenhouse gas emissions by source:

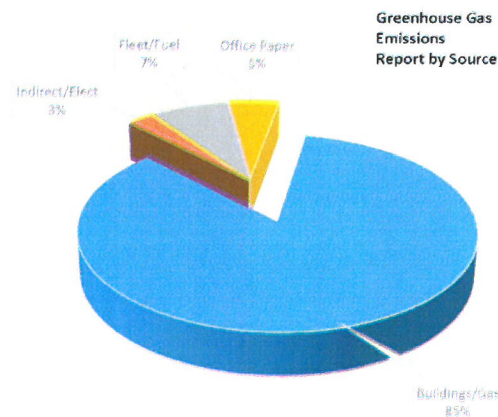
Out of Scope Emissions

Out-of-Scope Emissions include refrigerants: R-22 (HCFC), R-401a (HCFC), MP-39 (HCFC). Fugitive emissions are estimated to be less than one percent of the District's emissions based on the refrigerant recharge amounts of R-134a and R-404a (HFCs) in the year 2015. Thus, these emissions are deemed to be out of scope and have not been included in the total District's greenhouse gas emissions profile.

Emissions Sources	2013	2014	2015	2015 vs 2014
Buildings	5295	5369	4444	-20.9%
Indirect	207	140	134	-4.5%
Fleet	404	351	388	+10.5%
Office Paper	272	225	254	+12.4%
Exemption	-13	-11	-12	
Adjustments	2			
Total Emissions	6167	6074	5207	-16.7%

Offsets Applied to Become Carbon Neutral in 2015

The total emissions offset applied to become carbon neutral is 5,207 tCO₂e which includes an offset exemption of 12 tCO₂e for Biomass emissions. The net offsets purchased cost the District \$136,683.75, including GST.



Annual Heating Degree Days for Prince George

2015	4462.7
2014	4907.7
2013	4789.5

Heating degree days (HDD) indicate how much energy is required to provide heating compared to another year. Utilizing this information we can normalize weather to find out if our emission reduction projects are working.

2015 indicated we required 10% less HDD than 2014 and 7.3% less than 2013. The data also indicates we used 20.9% less energy in 2015 than 2014. Therefore, weather alone did not contribute to all of the savings achieved. Our emission reduction projects are working!

Emissions Reduction Programs

The 2015 emission reduction projects involved replacing equipment that was end-of-life, had a high cost to operate, and contributed to our overall greenhouse gas emissions. Much of the work involves removal of hazardous materials, old equipment, and bringing new building management controls and operation online for the new equipment.

Heating Ventilation Air Conditioning

Lac des Bois – New Boiler System



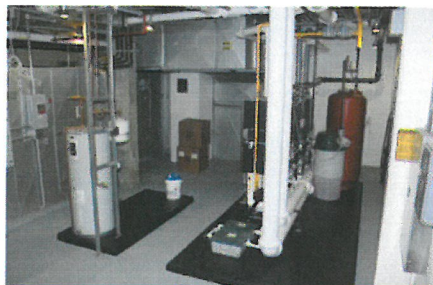
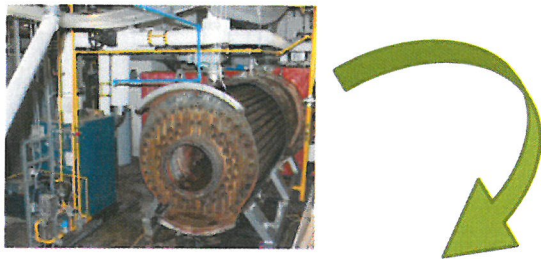
Lac des Bois Elementary, Nusdeh Yoh Elementary, Central Administration

Existing, inefficient, atmospheric type boiler systems that were at the end of their operating life needed to be replaced. In the summer of 2015, these boilers were removed and new condensing boilers were installed. A dramatic reduction in greenhouse gas emissions was achieved as a result. These boilers not only operate more efficiently, they provide a more reliable, stable heating plant for the school as well.

Spruceland Traditional Elementary

Existing natural gas multi-zone units were replaced with new hydronic systems connected to a new condensing boiler plant.

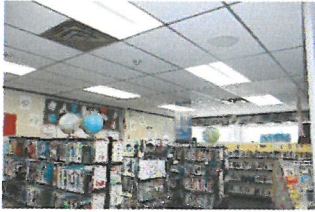
Further reductions were realized by removing electric heated terminal units in additional classrooms and connecting them to the boiler plant. New electronically commutated motors (ECM) are installed as a standard, reducing our electricity consumption by half for ventilation requirements. A state of the art direct digital control (DDC), building management system (BMS) allows us to control every aspect of the individual classroom environment. Teachers now have the flexibility to make some adjustment of their classroom temperatures for each and every room.



Central Administration Boiler Replacement

Emissions Reduction Programs (cont.)

Lighting



**Malaspina Elementary,
Nusdeh Yoh Elementary,
Southridge Elementary**

LED lighting replacements made big inroads at each of these schools with the inclusion of outdoor and indoor systems contributing to the overall energy reduction. Pot lights, strip lights, troffer lights, perimeter lights, and pole lights were affected. Furthermore, the installation of occupancy controls in each space has resulted in significant reductions in electricity consumption and of course, the cost to operate. Although this affects our emissions footprint on a smaller scale, it all contributes to our overall totals. By utilizing LED technology we reduced a large amount of operations and maintenance, excess heat, and utility costs. Further work on initiating a dark campus strategy is underway, reducing vandalism and extending the equipment life.

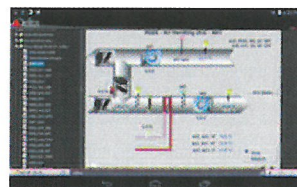
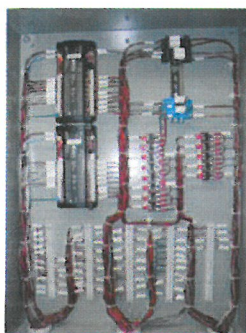
Domestic Hot Water



**Edgewood Elementary,
Pinewood Elementary,
Heritage Elementary,
Malaspina Elementary**

Showers are not used anymore in our elementary schools. The storage tank and the associated domestic hot water boiler is then removed and either another smaller gas fired residential unit or an electric residential unit is placed in service. This results in a number of benefits; lower GHG emissions, lower costs, lower maintenance, more room, less fire risk and lower ongoing permit costs.

Direct Digital Controls



DDC controls enable the sequencing of the heating, ventilation and lighting systems in the facility. Enhancements to their operation increase efficiency, air quality, and reduce GHG emissions.

Parts that are broken are identified and repaired, resulting in less time the equipment has to operate. New technology enables the technician to quickly pinpoint issues with the systems, even remotely, with a tablet or cell phone.

New analytics and reporting identify how often the machinery operates, collects sampling for air quality compliance, and a host of other parameters.

In Conclusion

The combination of previous year's projects and influence from El Niño produced a 16.7% reduction in our carbon footprint over 2014. Unfortunately we cannot count on the weather to continue to be mild and history from the past 25 years has shown us that it will fluctuate in a rhythmic pattern. We should therefore see a return of the normal weather, eventually. Further GHG projects are required to continue to reduce our carbon footprint.

In 2015 we continued to reduce our carbon footprint by installing more efficient heating systems. Two additional boiler projects are planned for 2016, along with additional low temperature unit ventilator installations, DDC controls upgrades and improved control strategies. This should continue to substantially reduce our use of fossil fuels.

We continue to strive for the most efficient operation of the facilities and will be engaging our partners in Education - the Principals, Staff and Students - to accomplish our goals.

We will look forward to another exciting year as we look back at the accomplishments in 2015.

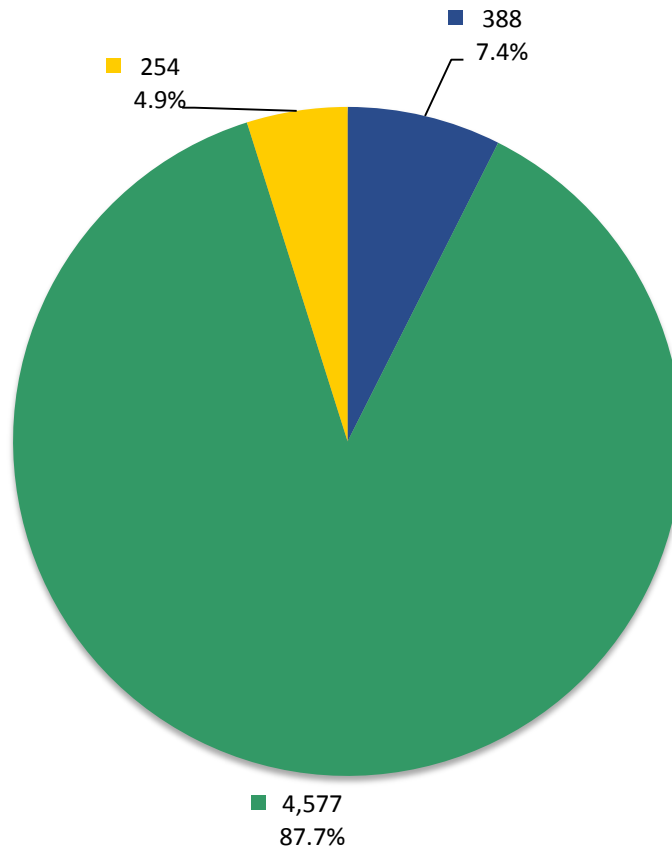
Sincerely,

A handwritten signature in blue ink, appearing to read 'B Beppe', with a stylized flourish at the end.

Barry Beppe
Energy and Sustainable Conservation Coordinator
School District No. 57, Prince George

* MEASURE * REDUCE * OFFSET * REPORT * PLAN *

**School District 57 - Prince George
Greenhouse Gas Emissions by Source
for the 2015 Calendar Year (tCO₂e*)**



Total Emissions: 5,220

- 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 9:13 AM)

Total offsets required: **5,207**. Total offset investment: **\$130,175**. Emissions which do not require offsets: **12** **

*Tonnes of carbon dioxide equivalent (tCO₂e) is a standard unit of measure in which all types of greenhouse gases are expressed based on their global warming potential relative to carbon dioxide.

** Under the *Carbon Neutral Government Regulation of the Greenhouse Gas Reduction Targets Act*, all emissions from the sources listed above must be reported. As outlined in the regulation, some emissions do not require offsets.

2015 Carbon Neutral Action Report Survey

Organization Name:

School District No. 57

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:

No

If Yes, please describe:

(No response)

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:

*Replaced inefficient boiler systems with new condensing boiler systems in 3 schools and an administration building.
Reduced electricity consumption through the replacement of all lighting systems at 3 elementary schools.
Reprogrammed DDC Building Management Systems to reduce consumption of both Natural Gas and electricity.*

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)

Yes

If yes, please describe:

Double-sided printing is standardized on all photocopiers. 100% Recycled content is not yet approved for use by the manufacturer.

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:

(No response)

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)

No

Encouraged or allow telework/working from home:

No

Other:

(No response)

Education Awareness

Have a Green/Sustainability/Climate Action Team:

No

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:

Yes

Other:

Hired a full time Energy & Sustainable Conservation Coordinator in October 2015.

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:

Yes

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

Yes

Other:

(No response)

Other Sustainability Actions

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

Yes

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)