2018 Carbon Neutral Action Report

Kelly Road Secondary, May 2019

Learning that Enriches the Life of Each Student

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

School District No. 57 (Prince George)

www.sd57.bc.ca

Contents

2018 Carbon Neutral Action Report

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This Carbon Neutral Action Report for the period January 1st to December 31st 2018 summarizes our emissions profile, the amount of offsets purchased to reach net zero emissions and the actions we have taken in 2018 to reduce our greenhouse gas emissions.

By June 30, 2019, 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 2018 we have continued our efforts to reduce our carbon footprint by;

- upgrading inefficient, atmospheric type gas fired boiler systems with high efficient condensing units
- optimizing the use of condensing boilers by installing new low temperature fan coils and panels
- exchanging lighting systems across the district with LED technology
- optimizing the building automations systems to improve operation and reduce energy use

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

Our cover page shows the Board of Education and Ministry of Education's commitment to the environment in our new Kelly Road Secondary construction project. Building to LEED Gold standards and showcasing geo-thermal and LED lighting equipment throughout the facility proves that the technology does and can work. When completed it is estimated to have a 95 ekWh/m2 energy footprint, it will be exceedingly efficient.

For the year 2018, our District's total emissions were 5229 tCO^2e.

I am pleased to present the following report outlining our efforts forward, to become carbon neutral.

Barry Bepple
Energy & Sustainable
Conservation Coordinator

Emissions and Offsets Summary Table:

School District No. 57 (Prince George) GHG Emissions and Offsets for 2018 (TCO2E)	
GHG Emissions created in Calendar Year 2018	
Total Emissions (TCO2E)	5241
Total Offsets (TCO2E)	5229
Adjustments to GHG Emissions Reported in Previous Years	
Total Emissions (TCO2E)	*0*
Total Offsets (TCO2E)	*0*
Total Emissions for Offset for the 2017 Reporting Year	
Total Offsets (TCO2E)	*5229*

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 2018 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

2019-06-10
Date

Darlene Patterson
Name (Print)

Secretary Treasurer
Title

2018 Greenhouse Gas Emissions

For the 2018 calendar year, School District No. 57's greenhouse gas emissions (GHG) offsets were 5,229 tonnes of CO^2e.

The following summarizes the greenhouse gas emissions by source:

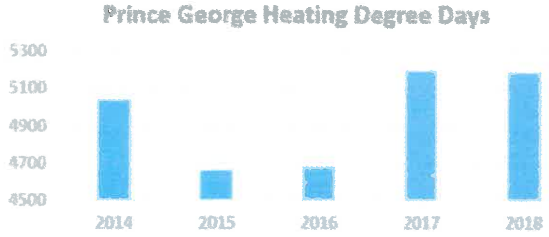
Out of Scope Emissions

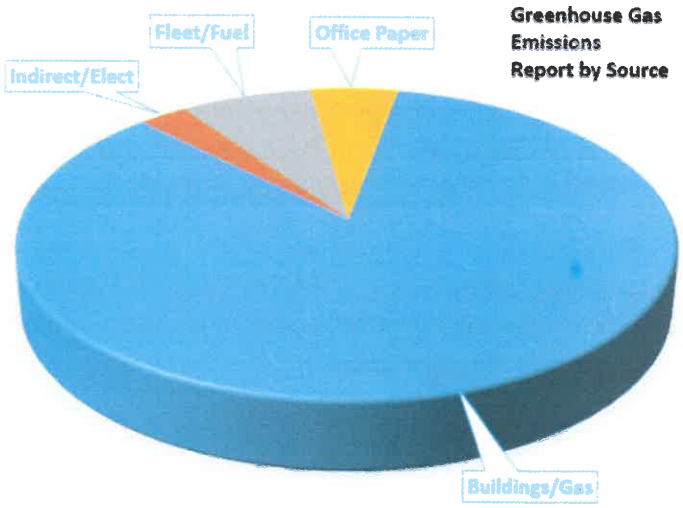
Out-of-Scope Emissions include refrigerants: R-22 (HCFC), R-401a (HCFC), MP-39 (HCFC). Fugitive emissions are estimated to be less than one percent of the District's emissions based on the refrigerant recharge amounts of R-134a and R-404a (HFCs) in the year 2018. Thus, these emissions are deemed to be out of scope and have not been included in the total District's greenhouse gas emissions profile.

Emissions Sources	2016	2017	2018	2018 vs 2017
Buildings	4322	4698	4445	-5.4%
Indirect	143	147	145	-1.4%
Fleet	379	412	392	-4.9%
Office Paper	240	251	259	3.2%
Exemption	-12	-13	-12	
Adjustments	0	0	0	
Total Emissions	5072	5520	5229	-5.3%
HDD	4678	5200	5192	-0.2%

Offsets Applied to Become Carbon Neutral in 2018

The total emissions offset applied to become carbon neutral is 5,229 tCO^2e which includes an offset exemption of 12 tCO^2e for Biomass emissions. The net offsets purchased costs the District $137,261.25 including GST.





Annual Heating Degree Days for Prince George—data provided by princegeorgeweatherstats.ca

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. The data indicates we used 5.3% less energy in 2018 than 2017, while our HDD are virtually the same at 0.2% less. Our largest emission source is Natural Gas and Propane Gas, used for heating, which is a reason we emit as much as we do.

Emissions Reduction Programs

2018 emission reduction projects involved the continuation of 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.

Since our largest emissions source is Fossil Fuel heating equipment, our efforts are targeted towards making this equipment the most efficient possible. Utilizing the most modern, available, Building Management Systems (BMS) Direct Digital Controls (DDC), coupled with condensing, or high efficient boilers and furnaces, we aim to reduce our carbon footprint as much as possible. All equipment is able to be controlled remotely through our Wide Area Network (WAN) and will utilize a new style of graphical interface so that the entire BMS operation is subject to scrutiny at a glance, anywhere in the world. Further reporting features enable us to capture and display information over a time period. This enables us to find problems, correct them, and return the equipment back to full operation more efficiently than was previously possible.

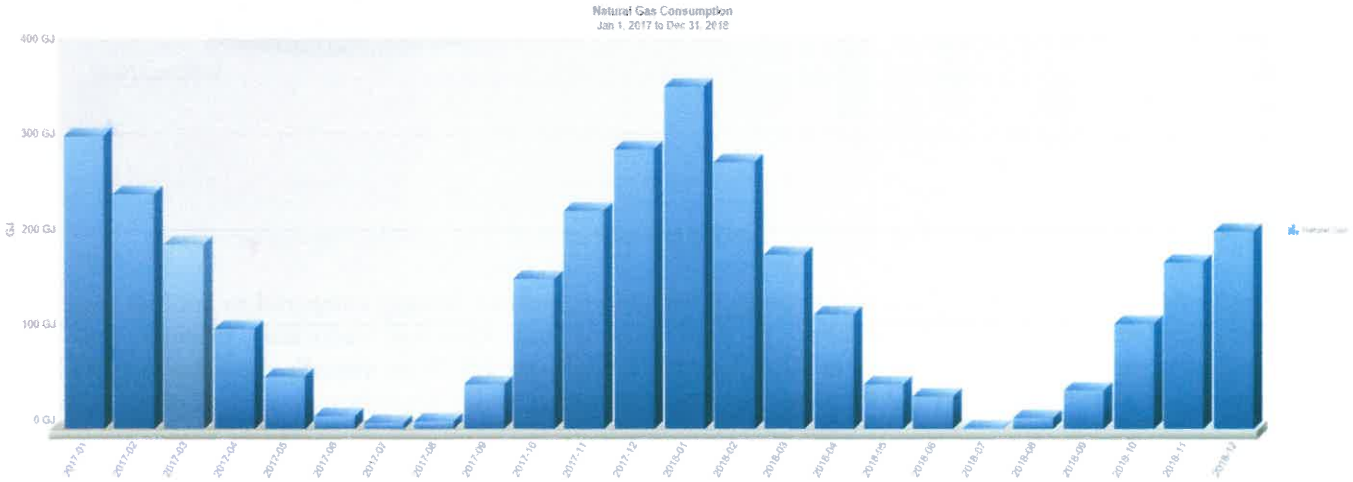
New benchmarking standards compare each building through online data collection software called AssetPlanner. By comparing the consumption data, carbon footprint and trends of the building operation over a long period of time, we can find out if the facility is performing as expected. Data from other school districts, across Canada, is analyzed for further use and comparison through the Energy Star Portfolio Manager software.

Heating Ventilation Air Conditioning

Heritage Elementary

Continuing on the success of past projects, we replaced the natural gas fired atmospheric boilers at Heritage Elementary with new condensing boilers and DDC systems in the summer of 2018. Reducing the amount of natural gas we burn reduces the amount of emissions at the same time, while giving us savings in our utilities budget. This project was assisted in funding by the Fortis BC Energy Inc. Efficient Boiler Program. Efficiencies of up to 30% are expected over the previous boilers.

Further improvements by refining the DDC Controls Systems and adding high-efficient pumping systems resulted in significant, measurable savings as shown in the graph below.



Terminal Units/Fan Coils

If the facility has a single weak link in the heating system, driving the temperatures to operate within it's parameters, rather than those of the heat generating units, then you will not have the best and most efficient heating system you paid for. For most of our facilities it means phasing work until you have all the pieces working harmoniously to squeeze the most energy out of the source you can.

At Prince George Senior Secondary the hallways and storage rooms were still using existing equipment that were operating at higher temperatures. These have all been replaced with low temperature units, allowing us to operate the facility at a lower temperature in the shoulder seasons, resulting in greater efficiency.

Lighting Projects

LED ceiling lighting was replaced at Prince George Secondary School in the Learning Commons and computer lab during a recent asbestos management project. We took advantage of one project and did another, sharing the costs, which resulted in both lower electricity consumption and lower ongoing maintenance costs.

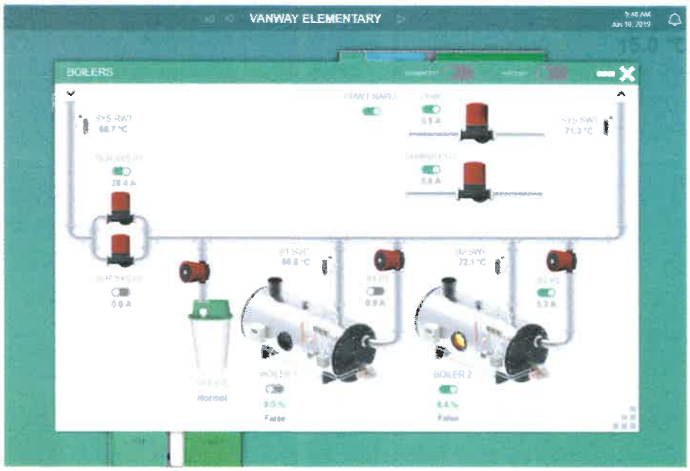
LED Gymnasium Lighting replacement was completed at Heather Park Elementary to enhance the function of the lighting system, reduce energy consumption and reduce ongoing maintenance costs.

Direct Digital Controls

Building Management System controls were installed in the 1990's to control our temperature, boilers, furnaces and heating / ventilation equipment. These controls were subject to failures due to the age of the capacitors and other electronic components. The software was outdated and we couldn't take advantage of new strategies that we can now. Therefore we started on a campaign to replace all of these systems with the latest designs. We coupled this with new data collection and reporting features available with the new software and have been able to replace the following systems during 2018;

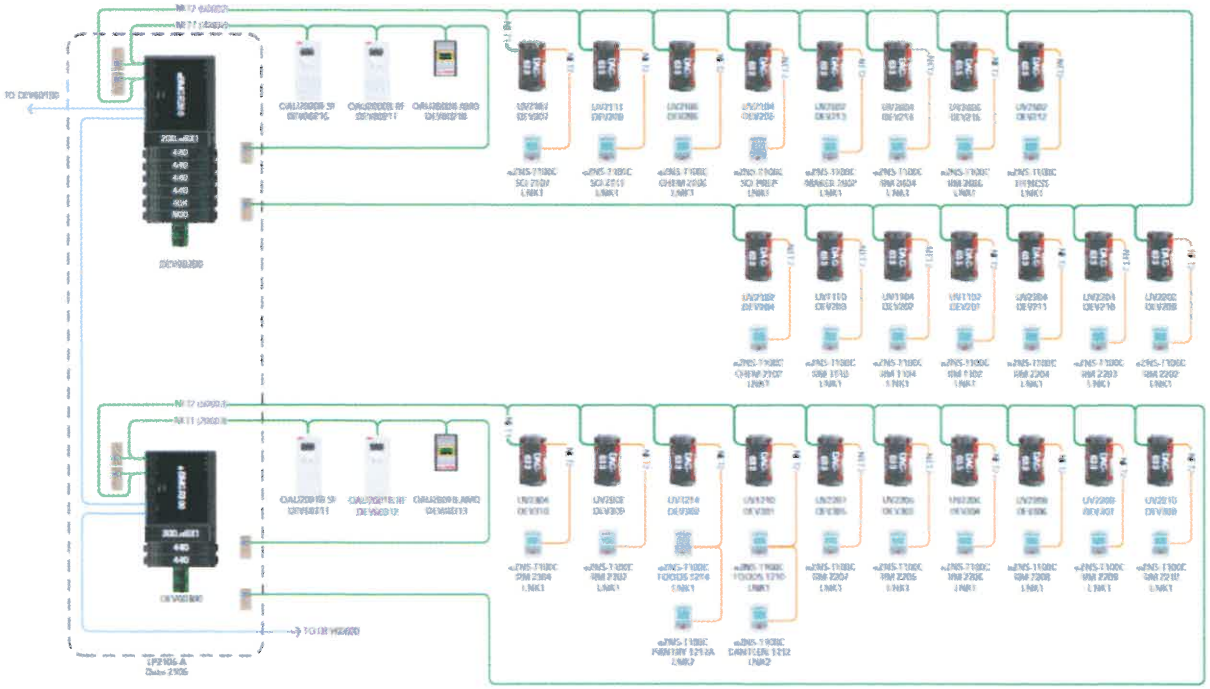
Pinewood Elementary

Vanway Elementary



Our new Kelly Road Secondary will have the latest hardware installed in the school, to control the various components of the HVAC system. These systems are complex and require detailed instructions on how to operate the facility to provide the most efficient use of the energy used, reducing GHG emissions and the costs associated, while providing an environment that supports the learning for students.

Kelly Road Secondary Network Architecture:



In Conclusion

In 2018 we continued to reduce our carbon footprint by installing more efficient heating and lighting systems and then controlling the operation and schedule of them. An additional boiler project is planned for 2019, 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. Further savings are expected on electricity consumption with additional installations of LED lighting to upgrade our gymnasiums, learning commons and classrooms.

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 2018.

Sincerely,

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

* MEASURE * REDUCE * OFFSET * REPORT * PLAN *