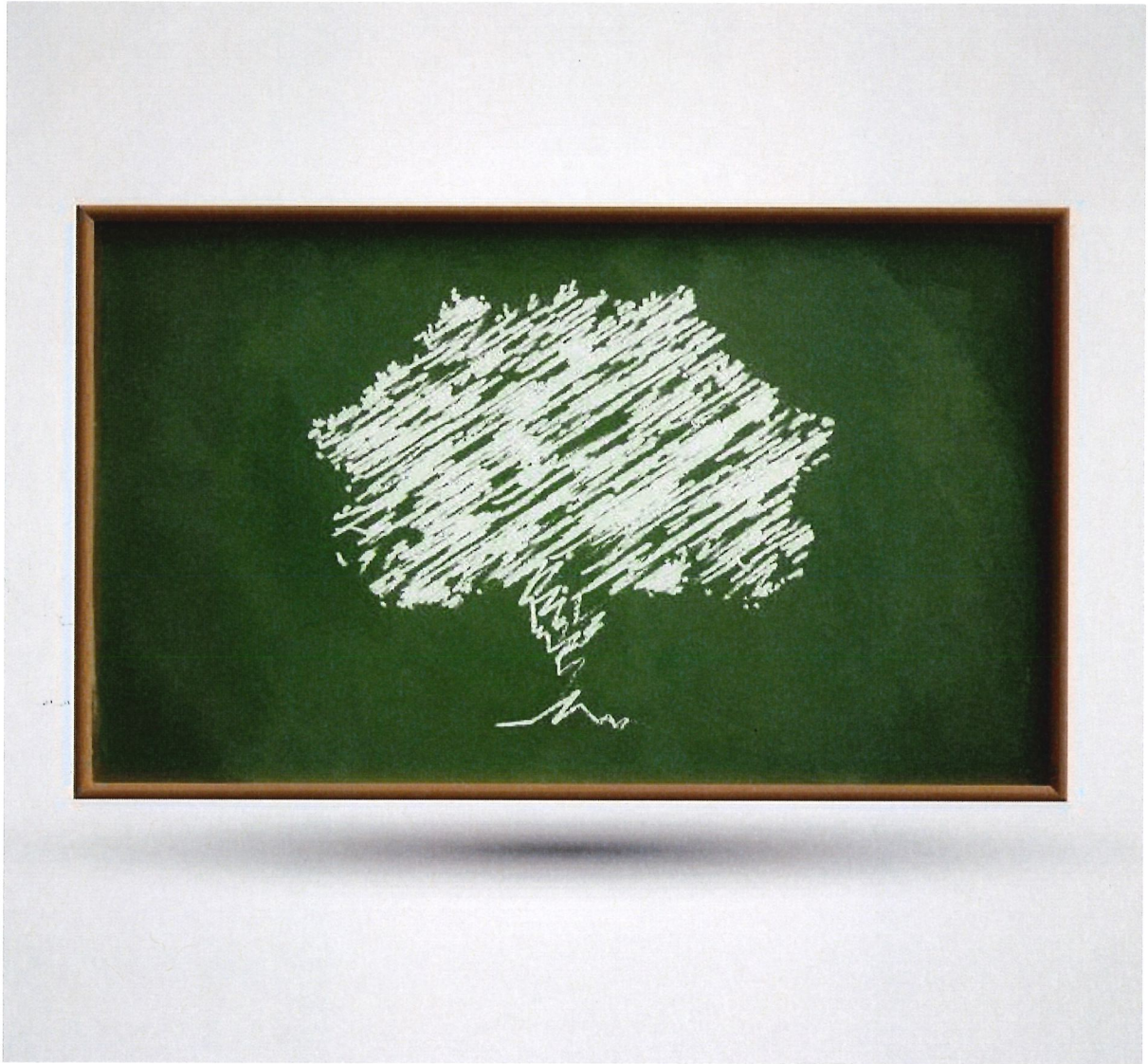
ABBOTSFORD
SCHOOL DISTRICT
RESPECT OPPORTUNITY INNOVATION

2018 Carbon Neutral Action Report



Declaration statement: This Carbon Neutral Action Report for the period January 1st, 2018 to December 31st, 2018 summarizes our emissions profile, the total offsets to reach net-zero emissions, the actions we have taken in 2018 to reduce our greenhouse gas emissions and our plans to continue reducing emissions in 2019 and beyond.

By June 30, 2018 The Abbotsford School District's final *Carbon Neutral Action Report* will be posted to our website at http://facilities.sd34.bc.ca/departments/sustainability-utilities

Executive Summary

The Abbotsford School District has made a firm commitment to reducing its energy consumption and its greenhouse gas emissions (GHG's). This is made evident by the fact that the district began its GHG reduction efforts back in 2001 nearly 10 years before GHG reporting truly began. By 2010 the district had already reduced its natural gas and electrical consumption by over 30% each. Both energy consumption and GHG emissions have continued to decrease in the years since.

Currently the Abbotsford School District ranks as the second lowest producer of GHG emissions in the province compared to other school districts on a GHG per student basis. This is due largely to the fact that every year the district has made, and continues to make, investments in both the technology and the people needed to help foster a culture of conservation. From less paper initiatives to LED lighting upgrades and from green team events to electric vehicles, district personnel are constantly looking for new ways to innovate and save.

There were a number of GHG emission reduction projects completed last year, the most extensive of which was a complete LED lighting upgrade and boiler upgrade at Robert Bateman Secondary School. These projects are expected to generate a combined savings of 211,000 kWh of electricity and 417 GJ of natural gas each year significantly reducing the carbon footprint of this school. Building Envelope upgrades at both Bakerview Center for learning and Dormick Park elementary were also completed in 2018 and were projects that helped to reduce energy waste while simultaneously improving the comfort of building occupants.

Another highlight of 2018 was an increase in the number of electric vehicles the school district has as a part of its fleet. Three gas powered vehicles that were damaged in an extreme ice storm in Jan of 2018 were replaced with electric vehicles and an additional 12 level 2 charging stations were added in strategic locations throughout the district in order to establish the charging infrastructure needed to support the addition of more electric fleet vehicles in the future.

GHG reduction initiatives are continuing in 2019 with a focus on LED lighting upgrades. 18 sites are slotted to receive small scale LED lighting upgrades. The school district's facilities and maintenance yard will undergo a complete LED lighting upgrade which will include, for the first time, the addition of Networked Lighting Controls which are forecasted to significantly increase the energy savings and the GHG reduction potential of this project.

As the school district's primary goal is education, teaching our kids the value of conservation and the positive impacts that each and every one of them can have on the planet remains an important aspect of the district's GHG reduction program. Behaviour based initiatives around waste reduction, paper reduction and energy conservation are some examples of the way in which students and staff are encouraged to take an active roll in helping to reduce GHG emissions both at school and within the surrounding communities where they live and play. It is through this combination of technological upgrades and behavior-based conservation efforts that the Abbotsford School District continues to drive down its greenhouse gas emissions year after year.

2017 Greenhouse Gas Emissions by source

Buildings

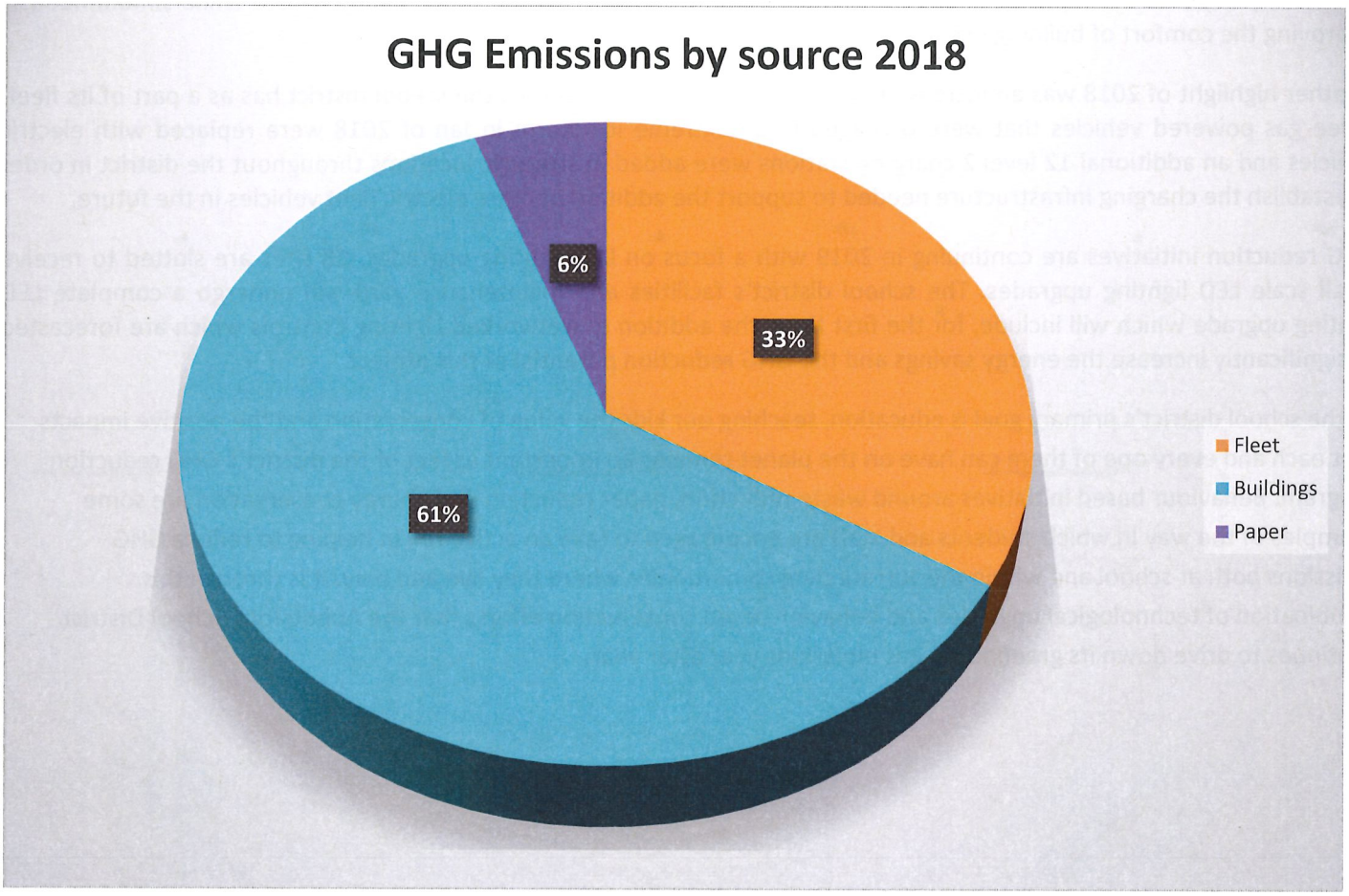
The biggest source of GHG emissions in the district comes from the use of natural gas and electricity for building heating and cooling. Electricity is also used for ventilation and lighting as well as for the electronics, appliances and computers needed to operate schools and other district facilities.

Fleet

Direct emissions generated by the burning of fossil fuels such as diesel and gasoline to power the district's fleet of maintenance vehicles and buses are accounted for in the fleet category.

Paper

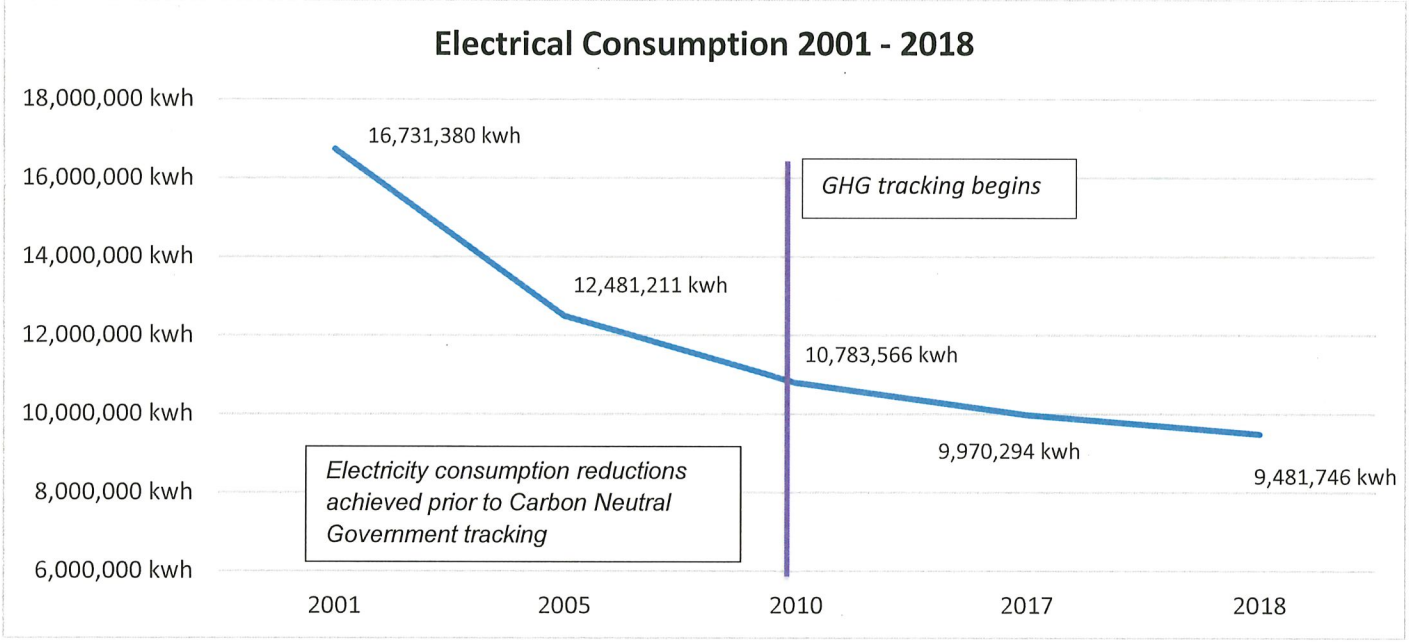
Indirect emissions generated through the production of paper which the district uses in schools and offices are accounted for in the paper category.

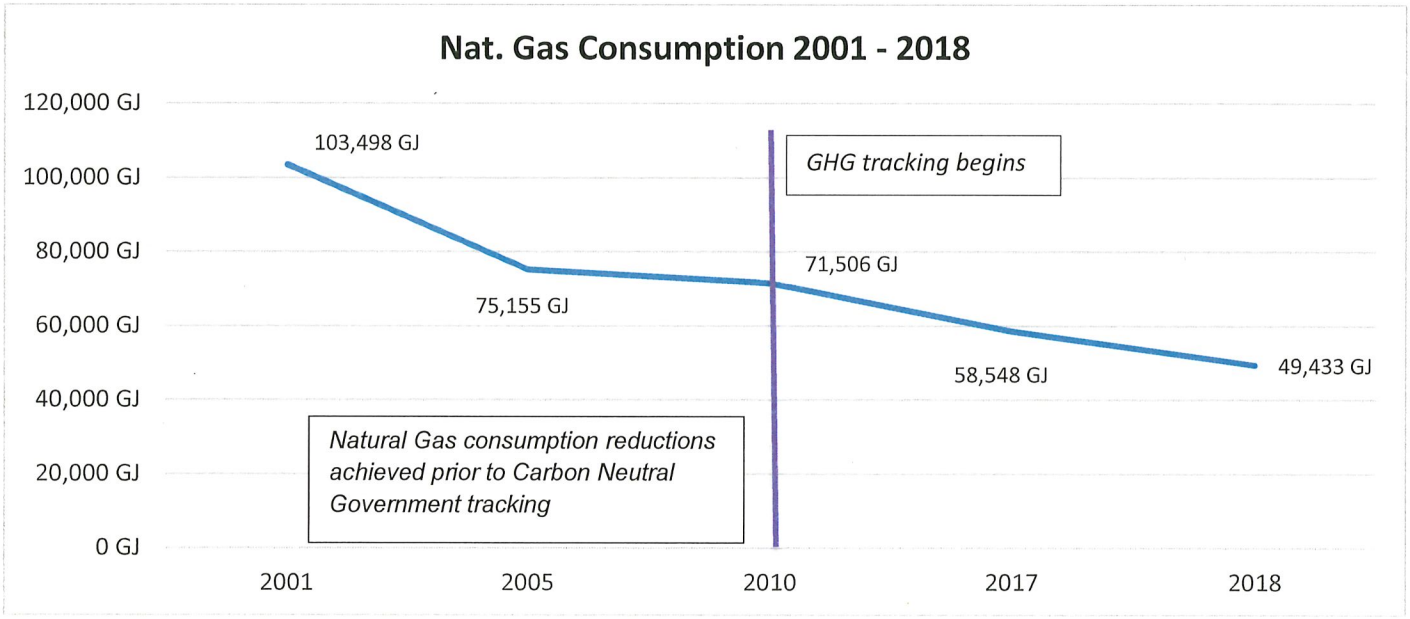


Historic Actions Taken to Reduce Greenhouse Gas Emissions

Abbotsford School District's journey to reduce greenhouse gas emissions began back in 2001 when the first energy conservation program was implemented. Through a combination of behavior change programs, equipment upgrades and building system optimization the district has steadily decreased its electricity and natural gas consumption over the past 18 years. This in turn has led to a significant reduction in GHG emissions.

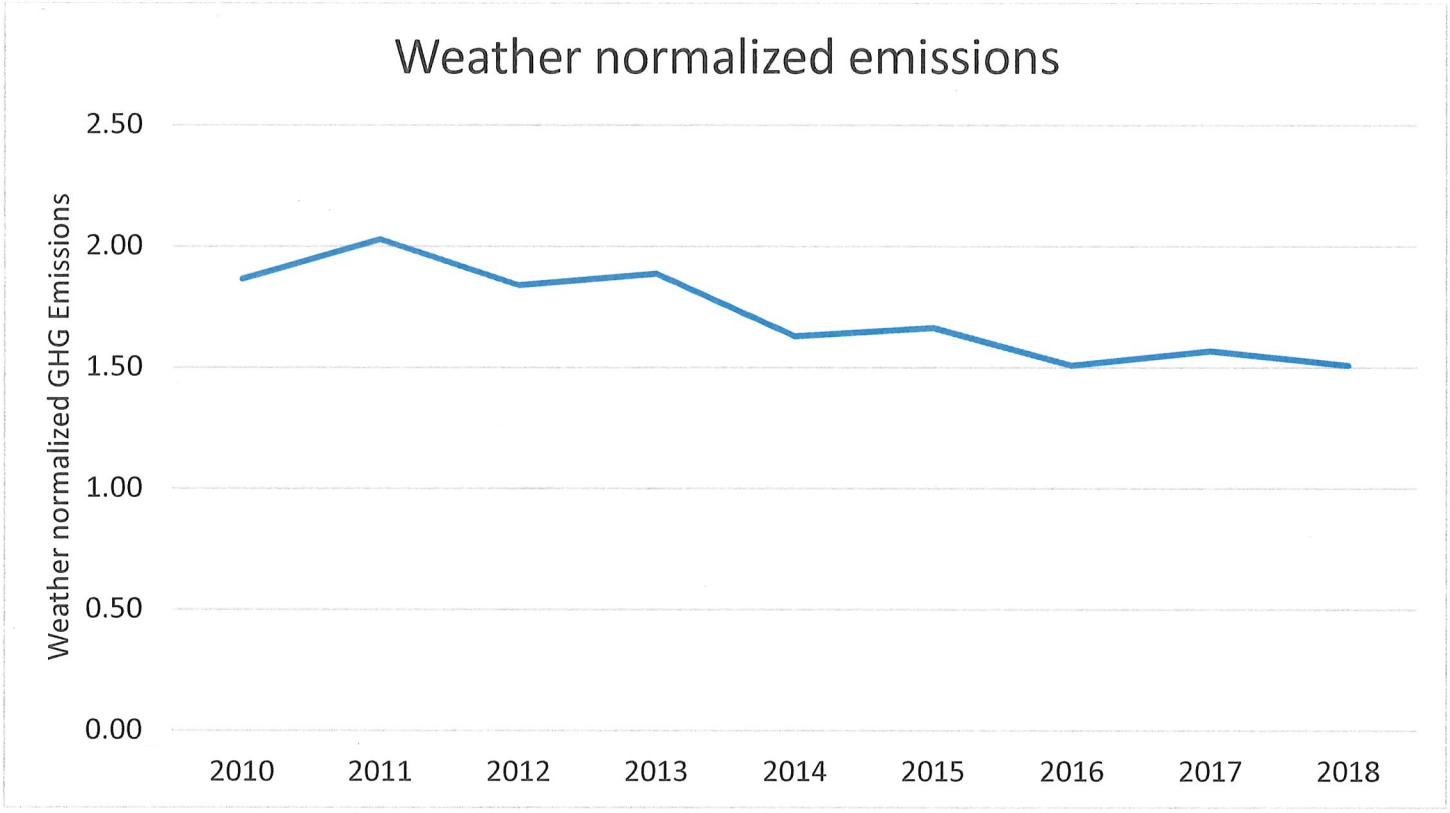
Although GHG emissions were not being tracked at the time, between 2001 and 2010 electricity consumption was reduced by 36% and natural gas consumption was decreased by 31%. Since GHG reporting began in 2010 the district has decreased electricity consumption by an additional 12% and natural gas consumption by an additional 30%.





Other GHG reduction measures have also been pursued in recent years. Initiatives such as "less paper" initiatives that numerous departments have undertaken have allowed the district to move away from paper-based documentation and communication towards a larger array of digital resources and systems. Also, in the fleet category, where feasible, the district has begun purchasing electric cars to replace gas powered vehicles in the district's fleet as they come due for replacement.

The combination of these varied GHG reduction initiatives has enable the Abbotsford School District to decrease its weather normalized GHG emissions by 19% since reporting began in 2010.



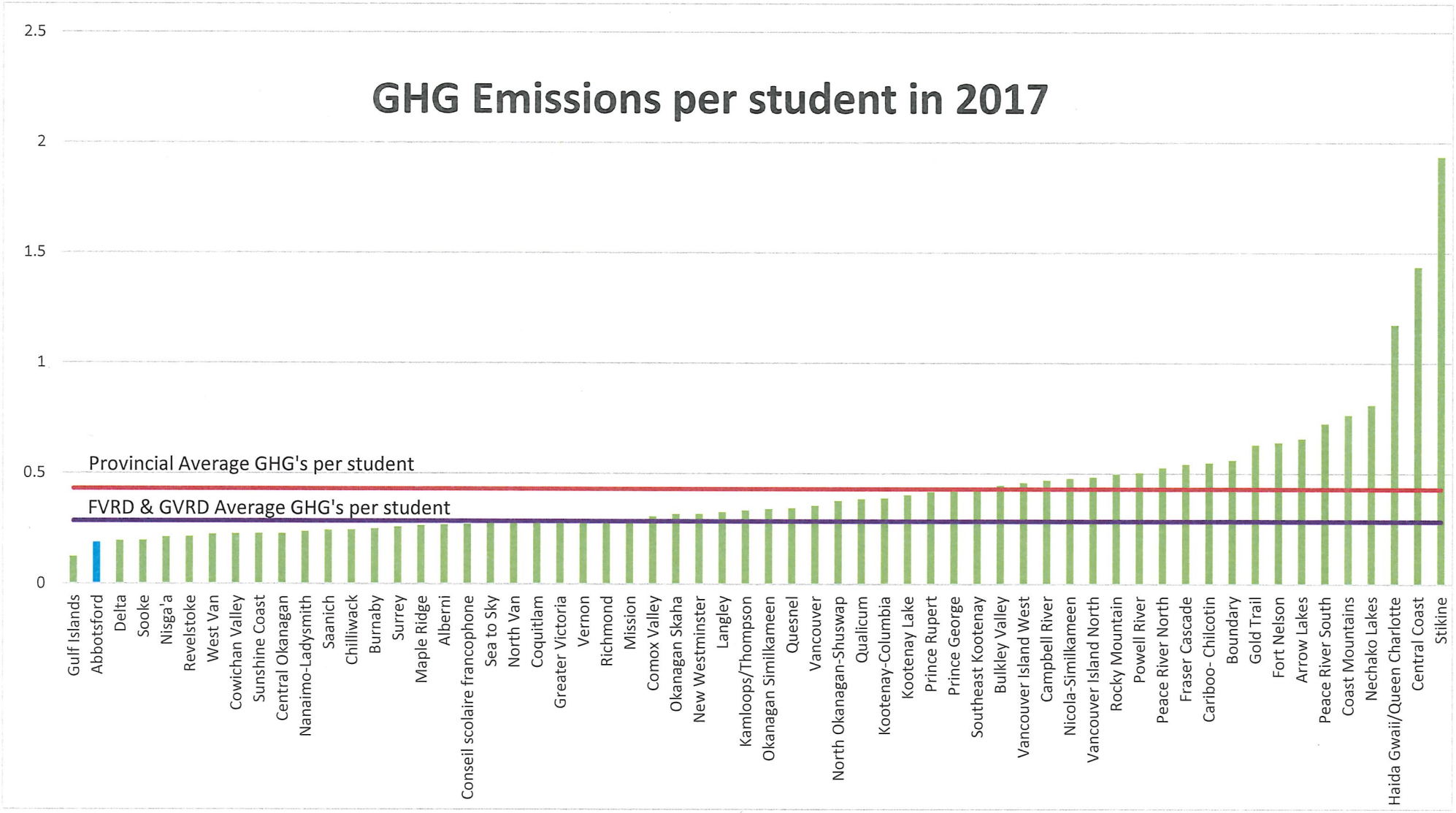
Actions Taken to Reduce Greenhouse Gas Emissions in 2018

Key projects undertaken:

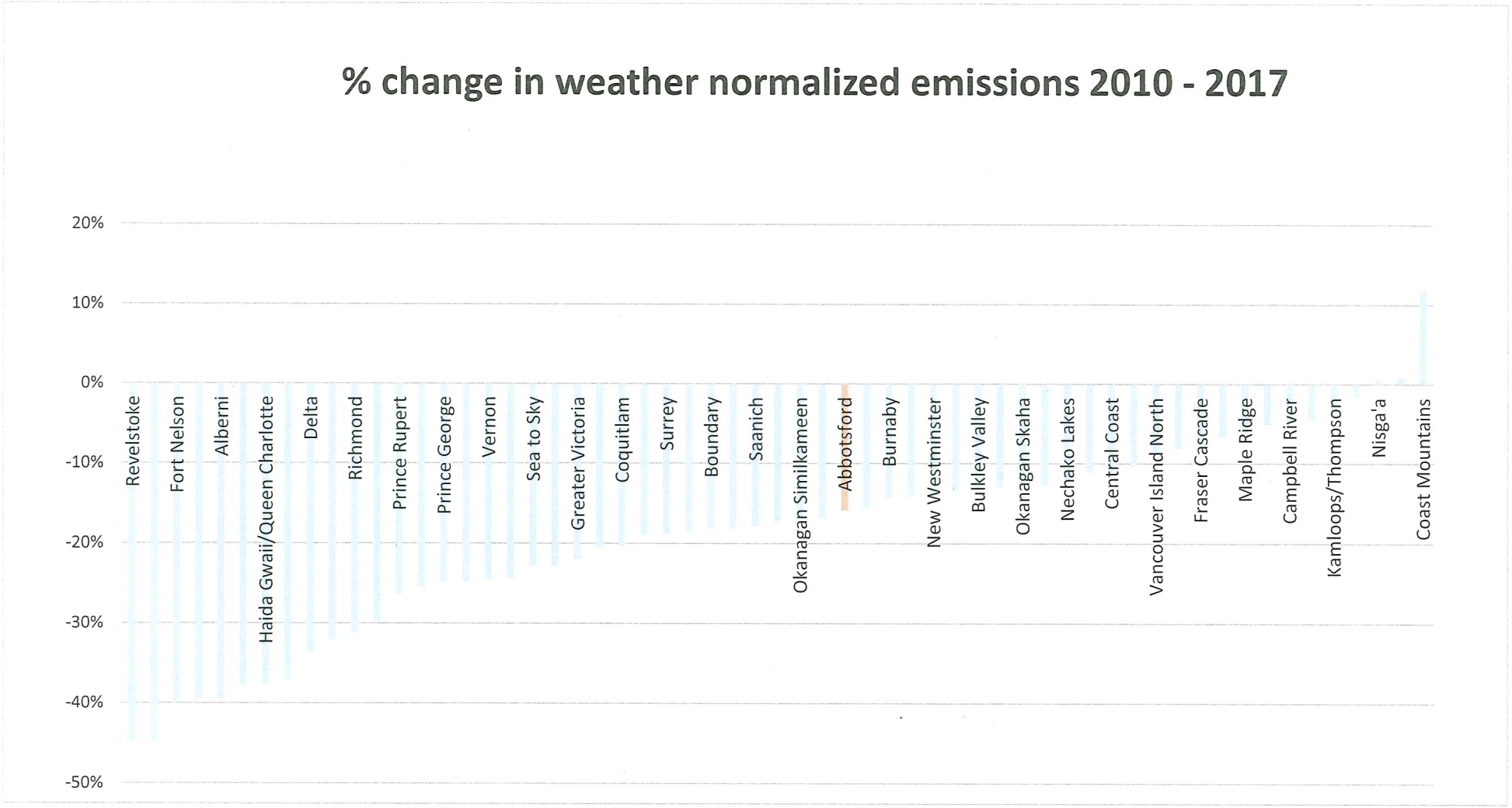
- Upgraded boilers to high efficiency units at:
  - Robert Bateman Secondary School
- Upgraded domestic hot water to high efficiency systems at:
  - Chief Dan George Middle School
  - Robert Bateman Secondary School
- Upgraded lighting throughout Robert Bateman Secondary School to LED fixtures and installed additional lighting controls to allow for both manual and automated dimming of various light fixtures.
- Building Envelope upgrades at
  - Bakerview Center for learning
  - Dormick Park Elementary
- Fleet Electrification
  - 3 EV's purchased to replace existing gas-powered vehicles
  - 12 new level 2 charging heads installed
- Building automation controls
  - Created tie-ins between security systems and the building automation system where possible to trigger an automated lights-off sweep any time that the security system is armed.
  - Sandy Hill Elementary: controls upgrade to allow for more efficient use of the building heating system.
- GHG related school based green team activities this year included campaigns such as
  - Unplug before you go, pre-holiday shut downs to conserve electricity and natural gas
  - Sweater days to conserve electricity and natural gas
  - Lights out lunches to conserve electricity
  - Battery and pen/marker recycling to divert waste from the landfill
  - Environmental pledges such as: use less paper, walk to school, turn off lights at home etc
  - Recycling and composting education
  - Park clean-up
- Several accounting and student enrollment reporting processes have been digitized this past year resulting in a further reduction of the district's paper usage.
- Updating of the district's technology infrastructure including iPads, Laptops and Chromebooks for staff and student use. This on-going initiative helps to facilitate the use of digital resources for learning and for office work. It is now possible for many documents to be accessed, worked on and shared or submitted digitally. This, in turn, helps to reduce the amount of paper used for a variety of tasks.

How do we compare?

Using data from the past annual Carbon Neutral Action Reports for school districts around the province the following comparisons have been compiled. This data has been organized on a per student basis in order to allow for easier comparison from one district to the next. Also, two different averages have been calculated. The first average is based on all schools in the province while the second average is based solely on those schools in the Greater Vancouver and Fraser Valley areas where weather conditions are more temperate than in many other parts of the province. This distinction was made because the heating requirements for a school in the Fraser Valley, such as those in Abbotsford, are generally less than the heating requirements in a northern school or one further inland. When compared on this basis the Abbotsford School District has the second lowest GHG emissions in the province.



In terms of the percentage change in emissions overtime, as of 2018, the Abbotsford School District has reduced it's GHG emission by 17% in terms of absolute emissions and 19% in terms of weather normalized GHG emissions. This leaves a 14% reduction drop still needed to reach the 2020 goal of a 33% reduction. It is important to note that part of the reason that the district does not have higher GHG reductions during the reporting period is because so much GHG reduction work was done before the tracking and reporting of GHG's began in 2010. Never the less, plans are in place to continue reducing GHG emissions every year.



**Note: At the time of writing 2017 GHG data is the most recent publicly available data for all school districts

Plans to Continue Reducing Greenhouse Gas Emissions 2019

Key Projects:

Small Scale LED lighting upgrades at 18 sites

- Chief Dan George Middle – Gym
- Terry Fox Elementary - Gym
- Ten Broeck Elementary – Gym & Exterior
- Dr. TA Swift Elementary – Gym
- Dave Kandal Elementary – Gym
- Clearbrook Elementary - Gym
- Matsqui Elementary – Learning Commons
- Margaret Stenersen Elementary - Learning Commons
- Harry Sayers Elementary – Parking lot & building exterior
- Yale Secondary – Parking lot
- Dormick Elementary – Parking lot
- Mt. Lehman Elementary – Gym and PAC kitchen
- Alexander Elementary – Exterior
- Aberdeen Elementary – Exterior
- Bradner Elementary – Exterior
- Clayburn Middle School – Exterior
- School Board Office – various locations
- Upper Sumas Elementary – Staff room/learning commons

- Full site LED lighting upgrade with Networked Lighting Controls at the Facilities and Maintenance Yard
  - Savings for the LED lighting upgrade portion of this project are 35,000 kWh of electricity which is equivalent to a 315 tonne/yr [1]reduction in CO_2
  - Networked Lighting Controls expected to generate additional electrical & GHG savings

- Building Envelope upgrades at
  - Upper Sumas Elementary - replacement of all windows completed March 2019

- Domestic hot water tank upgrades at 2 - 3 sites

- Electric Vehicle charging infrastructure
  - 2 level 2 charging heads to be installed at the Facilities and Maintenance Yard
  - 2 level 2 charging heads to be installed at Rick Hansen Secondary

- Continuous Optimization
  - Abbotsford Senior Secondary School – implementation of energy efficiency measures underway
  - WJ Mouat Secondary School – implementation of energy efficiency measures underway

- GHG related site based green team activities planned this year include:
  - Unplug before you go, pre-holiday shut downs to conserve electricity and natural gas
  - Sweater days to conserve electricity and natural gas
  - Lights out lunches to conserve electricity
  - Battery and pen/marker recycling to divert waste from the landfill
  - Computer monitor turn off campaign

[1] Calculated at 9 tCO_2e/GWh as per BC Hydro's greenhouse gas intensities 2015 as found on their website: https://www.bchydro.com/about/sustainability/climate_action/greenhouse_gases.html

Emissions and Offset Summary Table:

Abbotsford School District **GHG Emissions and Offset for 2018 (TCO2E)**	
GHG Emissions created in Calendar Year 2018	
Total Emissions (tCO_2e)	*3993*
Total $BioCO_2$	*55.12*
Total Offsets (tCO_2e)	*3290*
Adjustments to GHG Emissions Reported in Prior Years	
Total Emissions (tCO_2e)	*0*
Total Offsets (tCO_2e)	*0*
Grand Total Offsets for the 2016 Reporting Year	
Grand Total Offsets (tCO_2e)	3290
Total Offset Investment	$86,362.50

Retirement of Offsets:

In accordance with the requirements of the Greenhouse Gas Reduction Targets Act and Carbon Neutral Government Regulation, The Abbotsford School District 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 within 30 days, 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

May 27/19
Date

Name: Ray Velestuk

Title: Secretary Treasurer

Part 1: CNAR Survey

1. General Information

Name: Julianne Pickrell

Contact Email: julianne.pickrell@abbyschools.ca

Organization Name: Abbotsford School District

Sector: School District

Role - Please select your role(s) below.
If more than one individual completed the survey, multiple categories may be selected:

Energy Manager: Yes

Sustainability Coordinator: No

Administrative Assistant: No

Facilities/Operations Manager/Coordinator: Yes

CEO/President/Exec Director: No

Treasurer/Accounting: Yes

Superintendent: No

A. Stationary Sources (e.g. Buildings, Power Generators): Fuel Combustion, Electricity use, Fugitive Emissions.

1. Actions taken by your organization in 2018 to support emissions reductions from buildings.

a) Do you have a strategy to reduce emissions from stationary sources?

Yes

If yes above, what are the main goals?: - Foster a culture of conservation that encourages energy conservation behaviours on a daily basis
- Optimize existing building systems to eliminate energy waste and run as efficiently as possible
- Upgrade building heating and lighting systems on a progressive basis beginning with the worst performing systems and/or sites

b) Whether you have a strategy or not (1.a), briefly describe your organization's plans to continue reducing emissions from stationary sources:

I. Over the medium-term term (1-5 years)

- Upgrade natural gas fueled building heating equipment to high efficiency units on a progressive basis with worst performers targeted first
- Upgrade natural gas and electrically powered water heating equipment to high efficiency units on a progressive basis with worst performers targeted first
- Where possible use dual fuel or electric heat pumps in place of natural gas rooftop unit's to further reduce natural gas usage.
- Convert building lighting to LED with the conscientious use of controls
- Integrate heating and lighting systems with the district's building automation system where it makes sense to do so
- Begin integrating Networked Lighting Controls into new lighting upgrade projects

II. Over the long term (6-10 years)

Same as above plus
- building envelope upgrades
- integration of renewable energy systems such as solar walls and solar PV at select sites

d) Please describe your strategy's goals (if any) related to building retrofits.

Minor retrofits
- Upgrade all building exterior lighting to LED
- Upgrade gymnasium lighting to LED
- Tie-in to security systems

Major retrofits
- replace all old inefficient boilers with high efficiency modulating units
- replace rooftop units with heat pumps (electric or dual fuel) wherever practical to do so.
- relocation of heating piping from unheated crawlspace to conditioned ceiling space in one elementary school (two others completed previously)
- The addition of solar walls to several sites

Deep retrofits
- Addition of a ventilation system to one heritage elementary school where no ventilation system previously existed
- The addition of photo-voltaic panels & battery storage at some sites as a part of the long term strategy

I. What % on average of your building portfolio is retrofitted each year in the following categories (if any) - click here for further information:

Minor retrofits (e.g., low cost, easy to implement measures including caulking, lighting, adding roof insulation, etc.) (%): 10

Major retrofits (e.g., replacing windows and doors, equipment replacement such as boilers, etc.) (%): 5

Deep retrofits (e.g., replacing roof, replacing the heating, ventilation and air-conditioning system with a renewable technology like a ground-source heat pump, etc.) (%): 0.5

e) Please describe your strategy's re/retro-commissioning goals (if any)?

There are currently 2 sites enrolled in BC Hydro's Continuous optimization program. Our DDC dept also has a less formal internal continuous optimization process whereby they regularly review the building automation system and look for potential areas of improvement.

I. What % on average of your building portfolio do you recommission each year?: 10

f) Do you keep records of Refrigerant gases category and refilling volumes?

Yes

I. If yes, have you included the associated emissions in your reporting?

No

II. What, if any, mitigation approaches have been considered? Please describe.

All used refrigerant is reclaimed using a refrigerant reclaiming machine which draws the used refrigerant out and stores it in a sealed bottle which is then labelled to indicate what class of refrigerant it is. Bottles are stored until full and then returned to the wholesalers to be scrubbed and recycled and/or disposed of. Regular preventative maintenance on all of our refrigeration units is the primary method of mitigation as it helps to ensure that refrigerant gases are not escaping.

g) How many newly constructed buildings received at least LEED Gold certification in 2018: 0

I. How many newly constructed buildings did not receive LEED Gold certification?: 0

II. Please explain why LEED Gold certification was not obtained.

No new buildings constructed this year.

B. Mobile Sources (Vehicles, Off-road/portable Equipment): Fuel Combustion:

3. Actions taken by your organization in 2018 to support emissions reductions from mobile sources.

a) Do you have a strategy to reduce emissions from mobile sources?

Yes

I. If yes, what are its goals?

To gradually convert all fleet vehicles and mobile equipment to Zero-Emission-Vehicles as the technology becomes available to do so.

b) Whether you have a strategy or not (3.a), briefly describe your organization's plans to continue reducing emissions from mobile sources:

I. Over the medium-term term (1-5 years)

- Purchase 3 more electric light-duty vehicles to replace 3 existing gas powered light duty vehicles.
- Install additional charging stations at select locations throughout the school district
- Pilot one or more electric buses

II. Over the long term (6-10 years)

- Increase the number of EV charging stations at the facilities and maintenance yard to accommodate an increase in electric fleet vehicles.
- Begin incorporating Electric buses into the fleet
- Begin replacing medium and heavy duty fleet vehicles with electric, or plug-in hybrid vehicles as the tech becomes available to do so starting with a pilot program and expanding from there.
- Install Photovoltaic panels and battery storage at the facilities and maintenance yard to help offset any potential demand spike issues from EV charging.

c) How many fleet vehicles did you purchase from the following categories:

Electric Vehicle – EV - (e.g., Nissan Leaf, Chevy Bolt): 3

"Plug In" Electric Vehicle – PHEV (e.g., plug-in Prius, Chevy Volt): 0

Hybrid vehicle – HEV – non "Plug In"- (e.g., Toyota Highlander Hybrid): 0

Hydrogen fuel cell vehicle : 0

Natural gas/propane: 0

Gas/diesel vehicle: 4

I. If you purchased new gas/diesel vehicles, can you briefly explain why vehicles from the other categories were not chosen?

We have not yet found suitable zero emission vehicles which could be used in place of the gas/diesel vehicles that we purchased.

d) How many existing EV charging stations does your organization have in each category:

level 2: 13

level 3: 0

How many level 2 stations (if any) are specifically for your fleet vehicles: 7

How many level 3 stations (if any) are specifically for your fleet vehicles: 0

e) How many EV charging station(s) did you install in 2018 in each category:

level 2: 12

level 3: 0

How many level 2 stations (if any) were installed specifically for your fleet vehicles: 6

How many level 3 stations (if any) were installed specifically for your fleet vehicles: 0

f) Other actions, please describe briefly (e.g. charging station feasibility studies, electrical panel upgrades, etc.)

Feasibility study for the addition of another 2 charging heads for the facilities and maintenance yard

4. Please indicate the number of the vehicles in the following vehicle classes that are in your current fleet (including any purchased in 2018):

Definitions:

• Light duty vehicles (LDVs) are designated primarily for transport of passengers <13 and GVWR<3900kg
• Light duty trucks (LDTs) are designated primarily for transport of light-weight cargo or that are equipped with special features such as four-wheel drive for off-road operation (include SUVs, vans, trucks with a GVWR<3,900kg)
• Heavy duty vehicles (HDV) includes vehicles with a GVWR>3,900 kg (e.g. ¾ tonne pick-up truck, transport trucks)

a) Light duty vehicles (LDVs)

Electric Vehicles – EV - (e.g., Nissan Leaf, Chevy Bolt): 4

"Plug In" Electric Vehicle – PHEV -- (e.g., plug-in Prius, Chevy Volt) : 0

Hybrid vehicles – HEV – (e.g., non "Plug In"- older Toyota Prius, Toyota Camry hybrid): 0

Hydrogen fuel cell vehicles: 0

Natural gas/propane: 0

Gas/diesel: 6

b) Light duty trucks (LDTs)

Electric Vehicles – EV : 0

"Plug In" Electric Vehicle – PHEV: 0

Hybrid vehicles – HEV – (e.g., non "Plug In"- older Ford Escape Hybrid, older Chevrolet Silverado pickup hybrid etc): 0

Hydrogen fuel cell vehicles: 0

Natural Gas/propane: 0

Gas/diesel: 9

c) Heavy duty vehicles (HDV)

Electric Vehicles – EV : 0

"Plug In" Electric Vehicle – PHEV : 0

Hybrid vehicles – HEV – (e.g., non "Plug In"): 0

Hydrogen fuel cell vehicles: 0

Natural Gas/propane: 0

Gas/diesel: 102

5. Please indicate the number of the vehicles you plan to replace in your fleet:

How much do you budget per LDV?: 250000

How many LDVs do you plan to procure annually over the next 5 years?: 1

How much do you budget per LDT?: 35000

How many LDTs do you plan to replace annually over the next 5 years?: 0.5

How much do you plan to spend per HDV?: 50000

How many HDVs do you plan to replace annually over the next 5 years?: 5

C. Office Paper: Indicate which actions your PSO took in 2018:

6. Actions taken by your organization in 2018 to support emissions reductions from paper supplies.

a) Do you have an Office Paper strategy?

Yes

I. If yes, what are its goals?

- Gradually convert administrative tasks away from paper based systems towards computer and/or cloud based systems.
- Encourage the ethical and innovative use of technology in the classroom thereby empowering teachers to use more digital resources and fewer paper-based ones.

b) Whether you have a strategy or not (6.a), briefly describe your organization's plans to continue reducing emissions from paper use:

I. Over the medium-term (1-5 years)

- Payroll will be adding an online overtime reporting function to the existing absence management system thereby eliminating the use of paper-based overtime cards.
- The purchasing department will be moving to a digital purchase order system thereby eliminating the use of paper-based requisitions and purchase orders.
- The facilities department is creating digital versions of many of their safety forms and reports thereby improving access to these documents while employees are on the go while simultaneously reducing the use of paper-based forms.
- The health and safety department is moving towards having 100% of their site based reports submitted to head office digitally rather than by mail or fax thereby eliminating the use of a number of paper-based forms.

II. Over the long term (6-10 years)

IT upgrades will continue with a refresh of computers and tablets on a regular basis to help support the continued use of digital administrative systems. Training on the use of digital equipment and systems will also continue on an ongoing basis to give workers the skill set needed to comfortably work with computer based systems. Significant effort is also being made and will continue to be made on digital security to ensure that people can confidently file and store documents digitally rather than printing out multiple copies and physically storing them at multiple sites.

c) Have an awareness campaign focused on reducing office paper use

No

d) Purchased alternate source paper (bamboo, hemp, wheat, etc.)

No

e) Other actions, please specify.

All printers in the district have been set-up to default to double sided printing.