



5/29/2020

2019 Carbon Neutral Action Report



Energy Star Scorecard '100 out of 100'
year ending Dec 2019

Spruceland Elementary
April 29, 2020



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

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2019 Carbon Neutral Action Report

School District No. 57 (Prince George)

This Carbon Neutral Action Report for the period January 1st to December 31st 2019 summarizes our emissions profile, the amount of offsets purchased to reach net zero emissions and the actions we have taken in 2019 to reduce our greenhouse gas emissions and our plans to continue reducing emissions in 2020 and beyond.

By June 30, 2020, 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:

<https://www.sd57.bc.ca/Programs/DistrictDepts/Maintenance/>

Executive Summary

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

In 2019 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. For 2020 and beyond we plan on continuing on the success of our past actions.

For the year 2019 our District's total emissions were estimated to be 5229 tCO₂e.

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 2019 (TCO2E)	
As per the Directive issued March 31, 2020, each PSO will use their 2018 GHG Emissions as a placeholder for the purposes of their 2019 CNAR.	
Total Emissions (tCO ₂ e)	5241.4
Total BioCO ₂	12.4
Total Offsets (tCO ₂ e)	5229
Offset Investment (\$25 per tCO ₂ e)	\$130,725

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 2019 calendar year, together with any adjustments reported for past calendar years. The Organization hereby agrees that, in exchange for the Ministry of Environment Change Strategy (the Ministry) 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 May 11, 2020

Anita Richardson Superintendent

 Name (Print) Title

2019 Greenhouse Gas Emissions

For the 2019 calendar year, School District No. 57's greenhouse gas emissions (GHG) offsets were 5229 tonnes of CO₂e.

Out of Scope Emissions

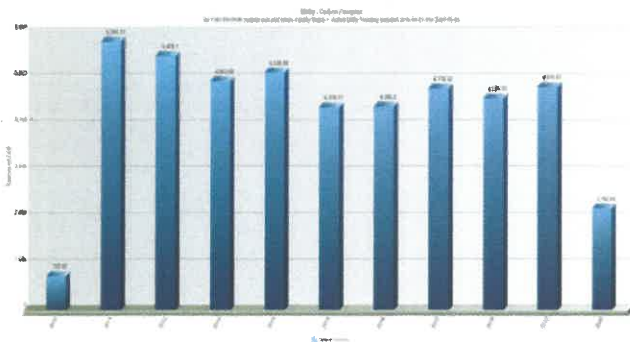
Out-of-Scope Emissions include refrigerants: R-22 (HCFC), R-401a (HCFC), MP-39 (HCFC). Fugitive emissions are estimated to be less than one percent of the District's emissions based on the refrigerant recharge amounts of R-134a and R-404a (HFCs) in the year 2018. Thus, these emissions are deemed to be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



Offsets Applied to Become Carbon Neutral in 2019

The total emissions offset applied to become carbon neutral is estimated to be 5,229 tCO₂e which includes an offset exemption of 12.4 tCO₂e for Biomass emissions. The net offsets purchased costs the District \$137,261.25 including GST.

Climate and Emissions



Information, posted to our AssetPlanner Work Order system - that monitors our utility expenses, compares our building fuel carbon emission data. Comparison of the last 9 years of data shows;

For the years 2011-2014 we averaged 5335 tCO₂e while for 2016 to 2019 we averaged 4638 tCO₂e. This is a **13% drop** in tCO₂e building emissions for these comparison years. (weather not normalized)

Heating Degree Days¹ (how much energy is required to provide heating compared to another year) averaged 4146 for 2011-2014, and 5094 for 2016-2019. This is 22% increase between the comparison years. We can therefore attribute the drop in building emissions to changes in the building operation and equipment.

Our climate zone lies on a line between zone 6 and 7A in the province. Our average HDD for the zone is between 4000 and 4999 which compares to less than 3000 for the lower mainland Vancouver and Victoria areas.

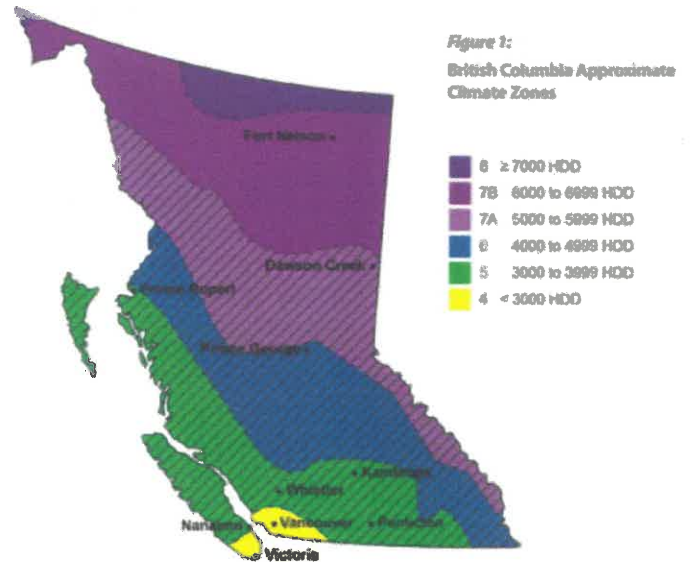


Figure 1:
British Columbia Approximate
Climate Zones

Emissions Reduction Programs—Energy Star

2019 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.

Abbotsford, School District No. 34, reported in their CNAR 2017 that the % change in weather normalized emissions from 2010—2017 was approximately **25% less** for School District No. 57 Prince George. Of 30 districts compared, Prince George was **8th best** on their list. We are on track to improve these numbers with further equipment replacements.

New benchmarking standards compare each building through online data collection software. 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. We currently use Asset Planner, Clean Government Reporting Tool and Energy Star Portfolio Manager for data analysis.

A building must earn an Energy Star Score of 75 or higher, indicating that it performs better than at least 75% of similar buildings nationwide, to earn potential certification.

Nineteen (19) schools, as of December 31, 2019, scored 75 or higher, 5 schools scored 90 or higher and 2 schools earned 100 out of 100 in School District No. 57 (Prince George). Not all data is finalized—we could expect even more to be added to the list, however this list includes all the electricity and fossil fuel consumptions.

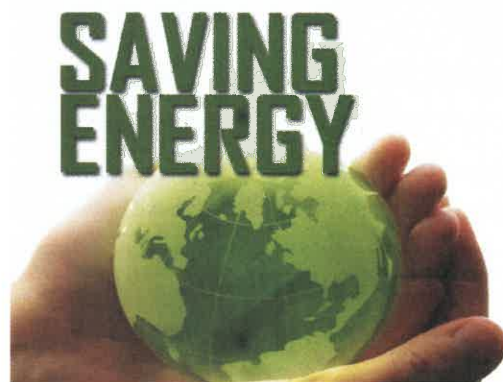
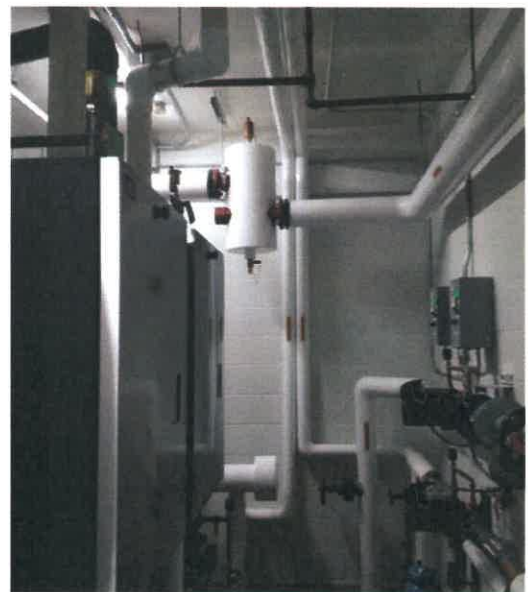


Certification is given on an annual basis and verified through a 3rd party, is expensive, and is not being pursued at this time.

Heating Ventilation Air Conditioning

Peden Hill Elementary

Continuing on the success of past projects, we replaced the natural gas fired atmospheric boilers at Peden Hill Elementary with new condensing boilers and DDC systems in the summer of 2019. 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 and the Ministry of Education. Efficiencies of up to 30% are expected over the previous boilers.



Terminal Units/Fan Coils

Unit ventilators at Ecole Lac des Bois Elementary have been systematically replaced in phases over the past several years, with 2019 being no exception. (For 2020 we have tendered the final phase, which will then take full advantage of the condensing boiler system installed in the facility.)

Having a dedicated unit ventilator for each occupied space results in more control for client comfort and will improve the indoor air quality, while providing GHG emission reductions and an overall lower energy footprint. This is possible using low temperature coils and demand controlled ventilation strategies with CO² sensors.



Domestic Hot Water

Replacement of the domestic hot water systems at DP Todd Secondary, Prince George Senior Secondary and Peden Hill Elementary with new Condensing on-demand hot water heaters occurred in the summer of 2019. This gives them more reliable and unlimited hot water while reducing our energy footprint at the same time. This will result in an overall reduction in GHG emissions.

Prince George Senior Secondary



DP Todd Secondary



Lighting Projects

Gymnasium lighting and dimming controls continue to receive important funding for replacement. In 2019 this was no exception with Buckhorn Elementary and Harwin Elementary receiving new lights and dimming controls for their gyms.

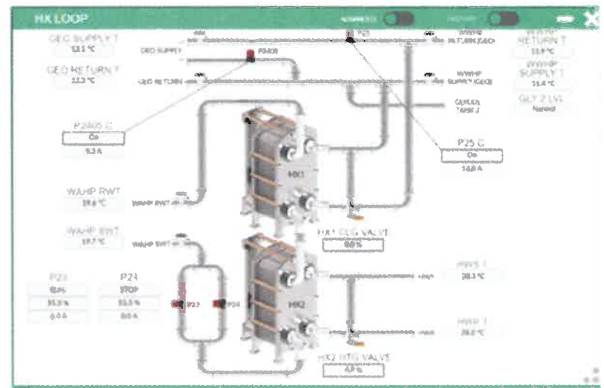
Other lighting projects included Prince George Senior Secondary Learning Commons upgrade and hallway lighting at Highland Resource Centre where the existing T-12 lights were replaced with LED.

Parking Lot lighting remains expensive and tough to do, unless you are renovating the site. At the Central Administration Building, an opportunity to replace the 400w Metal Halide lighting and poles was undertaken, resulting in a better lighting and significantly reduced consumption and monthly costs.

Direct Digital Controls

Building Management System controls, installed in the 1990's to control our temperature, boilers, furnaces and heating / ventilation equipment have been systematically replaced. 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 devices and reporting features available with the new software and have been able to replace the following graphics reporting systems during 2019;

- Beverly Elementary
- College Heights Elementary
- Giscome Elementary
- Glenview Elementary
- Mackenzie Secondary
- Southridge Elementary
- Valemount Elementary
- Van Bien Elementary



With the installation of the new Delta 'Copper Cube' technology we can look back up to 5 years and pin-point problems, trends and opportunities to improve our control systems. These automatic systems provide invaluable insights to the operation of the building.

New Mechanical Systems—state of the art Variable Frequency Drives (VFD)



'Water Furnace' water to water geo-thermal heat pumps



IBC Packaged Boiler Systems



In Conclusion

In 2020 we continued to reduce our carbon footprint by installing more efficient heating and lighting systems and then controlling the operation and schedule of them. Four further boiler projects are underway for 2020, and another one planned for 2021. Additional low temperature unit ventilator installations, DDC controls upgrades and improved control strategies are being implemented for summer 2020. At College Heights Secondary School the make-up air handling unit for the metalwork shop is tendered for replacement in 2020 as well. These improvements 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 with over 500 LED lighting fixtures being replaced the spring of 2020.

The road map ahead is as long as the list is for change. This continues to impact our operations. In 2019 we *added*; water bottle filler cooling stations, interactive projectors and whiteboards, hallway TV displays, commercial dishwashers, wood shop dust collectors, more portables, a major high school construction project, gymnasium speakers and sound systems with projectors, security cameras and lighting, and more theatre lighting for high schools. These changes in technology impact our energy footprint. But, we won't give up.

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 2019.

Sincerely,



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

* MEASURE * REDUCE * OFFSET * REPORT * PLAN *



Confirmation number: 00B9E8BF

Submitted date: 2020-04-01 15:24:41 Pacific Daylight Time

Carbon Neutral Action Report Survey - 2019

Public sector organizations (PSOs) are required to complete this survey, in addition to a Carbon Neutral Action Report (CNAR) as mandated by BC's [Climate Change Accountability Act](#) and the [Carbon Neutral Government Regulation](#).

Due to the COVID-19 pandemic, the following [Directive](#) was issued on March 31, 2020. Certain deadlines were also extended for the 2019 reporting year (see below).

March 31, 2020 Directive:

Under my authority as the Director for the purposes of the Act, and under the authority delegated to me in Section 6 of the Carbon Neutral Government Regulation, I hereby direct that all ministries and Public Sector Organizations covered by the Carbon Neutral Government requirement shall use their 2018 GHG emissions as a temporary estimate for their actual 2019 GHG emissions, for the purposes of the 2019 Carbon Neutral Action Reports and 2019 Carbon Neutral Government reporting required under the Climate Change Accountability Act.

Neil Dobson, Executive Director, Clean BC Implementation
Climate Action Secretariat

Although 2018 emissions data will be used as a placeholder for 2019, **all other (qualitative) components of the CNAR and CNAR Survey are to be completed with information from 2019 (e.g., actions taken or planned to reduce emissions)**. The only change to the survey is that the deadline was extended by one month to June 30, 2020.

This survey is divided into two parts:

Part 1 - Will be made public on the Climate Action Secretariat (CAS) [website](#) after June 30, 2020; however, it will not be appended directly to each individual PSO CNAR as was done in previous years. This section collects details about actions taken or planned to reduce emissions and is intended to supplement the legislative requirements in your CNAR.

Part 2 - Will NOT be made public. Information you provide in this section is important and will be used internally to help CAS staff with planning for emissions reduction and climate change adaptation initiatives. Although not required, PSOs are highly encouraged to complete Part 2.

Note: Survey progress can be saved at any time by clicking the "Save and continue later" button at the bottom of each page. A new window will open and you will be asked to provide your name and email. An email will be sent to you from Carbon.Neutral@gov.bc.ca with the subject line: "Questionnaire Link", which will include a hyperlink for the "Project: Carbon Neutral Action Report Survey – Broader Public Sector 2019". You can then continue responding at another time or email the hyperlink to a colleague to complete remaining section(s).

May 29, 2020	<ul style="list-style-type: none">The final, signed version of the CNAR (or Small Emitters Form) must be submitted by email to: Carbon.Neutral@gov.bc.ca
June 30, 2020*	<ul style="list-style-type: none">Ministry of Environment and Climate Change Strategy must post a final CNAR for each organization on the BC Government's CNG website and each PSO is encouraged to post the report on their website.The CNAR Survey (optional for Small Emitters) must be completed and submitted online. *Deadline extended from May 29, 2020.<u>All offset invoice payments must be submitted to CAS.</u>
Sept 30, 2020*	<ul style="list-style-type: none">Clean Government Reporting Tool (CGRT) Data Entry must be completed for the 2019 reporting year.

	*Deadline extended from April 30, 2020.
Oct 15, 2020*	<ul style="list-style-type: none"> • Self-Certification checklist must be completed, signed and submitted by email to: Carbon.Neutral@gov.bc.ca. *Deadline extended from May 15, 2020.

*See the [Carbon Neutral Government – Program Requirements website](#) for more information on program requirements, timelines and templates.

PART 1 - Included as part of your public CNAR report.

Reminder that Part 1 will be made public on the CAS [website](#).

Contact Name:	<i>Barry Bepple</i>
Contact Email:	<i>bbepple@sd57.bc.ca</i>
Organization Name:	<i>School District No. 57</i>
Role – Please select the best category for your current role with your organization. If more than one individual completed the survey, multiple categories may be selected:	Other - Please Specify: <i>Energy & Sustainable Conservation Coordinator</i>
Please select your sector:	School District (SD)

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

Actions taken by your organization in 2019 to support emissions reductions from buildings

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

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

Over the medium-term term (1-5 years)
<i>Implement additional DDC Scheduling measures. Continue replacing boiler systems with condensing units, thereby increasing efficiencies during run time.</i>
Over the long term (6-10 years)
<i>Replace terminal air handling units with low temperature units to force condensing boiler systems into condensing water temperatures.</i>

Please describe your strategy's goals (if any) related to energy audits.

Retro-commissioning and re-commissioning of all systems is to be accomplished within 5 years.

What % on average of your building portfolio has an energy audit completed each year (if any)?

5%

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

Continue replacing HVAC components and lighting systems, then moving on to envelope improvements.

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

5%

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

5 %

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.)

10%

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

Goal is to first audit systems with DDC controls (almost completely re-commissioned already), then to move onto air handling units for efficiency gains.

What % on average of your building portfolio do you recommission each year?

10%

Do you keep records of Refrigerant gases¹ category and refilling volumes?

[1] Fugitive emissions from stationary cooling equipment are attributed to the leakage and loss of HFC and PFC based coolants from air conditioning and commercial type refrigeration systems. Coolant loss can occur during the manufacturing, operation, and disposal of such equipment. Gases that may be reported via CGRT include HFC R-134, HFC R-134a, HFC R-404a, HFC R-407c, HFC R-410a.

No

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

n/a

How many newly constructed buildings received at least LEED Gold certification in 2019?

0

How many newly constructed buildings did not receive LEED Gold certification?

0

Please explain why LEED Gold certification was not obtained for those new buildings.

n/a

Other actions? Please describe briefly:

n/a

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

Actions taken by your organization in 2019 to support emissions reductions from mobile sources?

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

Yes

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

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

Install GPS tracking features to our white fleet, thereby reducing idle time and travel route mileage.

Over the long term (6-10 years)

Reduce and downsize our white fleet with the intent to move to EV's where suitable.

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

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

0

“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

0

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

We lease all gas vehicles - most of our white fleet is Heavy Duty Trucks.

Actions taken by your organization in 2019 to support emissions reductions from mobile sources? (Continued)

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

Level 2?

0

Level 3?

0

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

As defined as Level 2 stations only your organization's fleet vehicles may use

0

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

As defined as Level 3 stations only your organization's fleet vehicles may use

0

How many EV charging station(s) did you install in 2019 in each category:

Level 2?

0

Level 3?

0

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

As defined in the previous section

0

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

As defined in the previous section

0

Please briefly describe any other related actions, (e.g. charging station feasibility studies, electrical panel upgrades, etc.)

No action taken

Please indicate the total number of the vehicles in the following vehicle classes that are in your current fleet

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)

Light duty vehicles (LDVs)

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

0

"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

12

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

3

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

33

Actions taken by your organization in 2019 to support emissions reductions from paper supplies.

Briefly describe your organization's plans to continue reducing emissions from paper use:

Over the medium-term (1-5 years)

Continue to configure printers and photocopiers for double sided printing. Encourage the use of PDF files and the use of projectors for in-classroom technology.

Over the long term (6-10 years)

No action plans.

Do you have an awareness campaign focused on reducing office paper use?

No

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

No

Other 2019 actions, please specify

None taken.