



PSO Climate Change Accountability Report | 2022



ABBOTSFORD
SCHOOL DISTRICT
RESPECT OPPORTUNITY INNOVATION

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Declaration statement

This PSO Climate Change Accountability Report for the period January 1, 2022 to December 31, 2022 summarizes our greenhouse gas (GHG) emissions profile, the total offsets to reach net-zero emissions, the actions we have taken in 2022 to minimize our GHG emissions, and our plans to continue reducing emissions in 2023 and beyond.

Executive Summary

The Abbotsford School District (the 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, had reduced its natural gas and electrical consumption by over 30% each by 2010 when GHG emission reporting began, and continues to invest in GHG reduction initiatives every year.

The District has reduced its GHG emissions in all three focus areas, paper, buildings, and fleet and currently ranks as one of the ten lowest producers of GHG emissions in the province compared to other school districts on a GHG per student basis. These initiatives have also benefited the District by reducing operating expenses and gradually reducing the amount of carbon offsets that the District needs to invest in to maintain its carbon neutrality each year.

In 2022, the District undertook several GHG emissions reduction projects including LED lighting upgrades at 21 sites, a furnace upgrade at the Facilities and Transportation Yard, and building envelope upgrades at three sites. All these projects were aimed at reducing energy consumption and improving the comfort or functionality of indoor work and/or learning spaces.

Also, in 2022 the District completed the construction of Eagle Mountain Elementary School, a seismic upgrade at Abbotsford Traditional Campus, and the restoration of Upper Sumas Elementary. Each of these major projects will have an impact on the District's GHG emissions and climate resilience.

Eagle Mountain Elementary will add to the district's GHG emissions because it is an addition to the district portfolio rather than a replacement facility. However, energy modelling was used during the design to help ensure a high level of energy efficiency thereby minimizing long term GHG emissions impacts.

The seismic upgrade undertaken at Abbotsford Traditional Campus included building envelope upgrades and the replacement of end-of-life natural gas boilers with new high efficiency natural gas boilers. These initiatives will help to reduce heating and cooling demand, increase resilience to extreme heat events, and decrease the GHG emissions associated with natural gas consumption at this site.

The restoration of Upper Sumas Elementary included LED lighting upgrades that will help reduce electricity consumption and the upgrading of perimeter drainage which will help improve this site's resilience to any future flood events.

In 2023, the District has several projects planned to further reduce GHG emissions and improve climate resilience. Planned project highlights include high efficiency boiler upgrades at four sites, building envelope upgrades at three sites, the addition of ventilation to Aberdeen Elementary, and the replacement of existing rooftop units with high efficiency heat pumps at three sites. The installation of heat pumps will also help to increase climate resilience as they provide cooling as well as heating. This will help reduce the site's vulnerability to rising annual temperatures and extreme heat events while simultaneously reducing natural gas consumption.

2020 Greenhouse Gas Emissions Overview

Current State of the Inventory

As of 2022, the Abbotsford School District had reduced its GHG emission by 9% in terms of both absolute emissions and weather normalized GHG emissions (Figure 1). This falls 24% short of the District's target of a 33% reduction in absolute emissions below 2010 levels by 2025. This is due, in part, to emission increases seen the past 2 years as a direct result of the increased ventilation requirements issued by ASHRAE in response to COVID-19.

The projects undertaken in 2022 and those planned for 2023 and beyond are geared towards continuing to reduce GHG emissions every year while upholding the District's strategic focus on 4 key pillars - Student Success, Optimized Resources, Engaging Opportunities and Progressive Workforce.

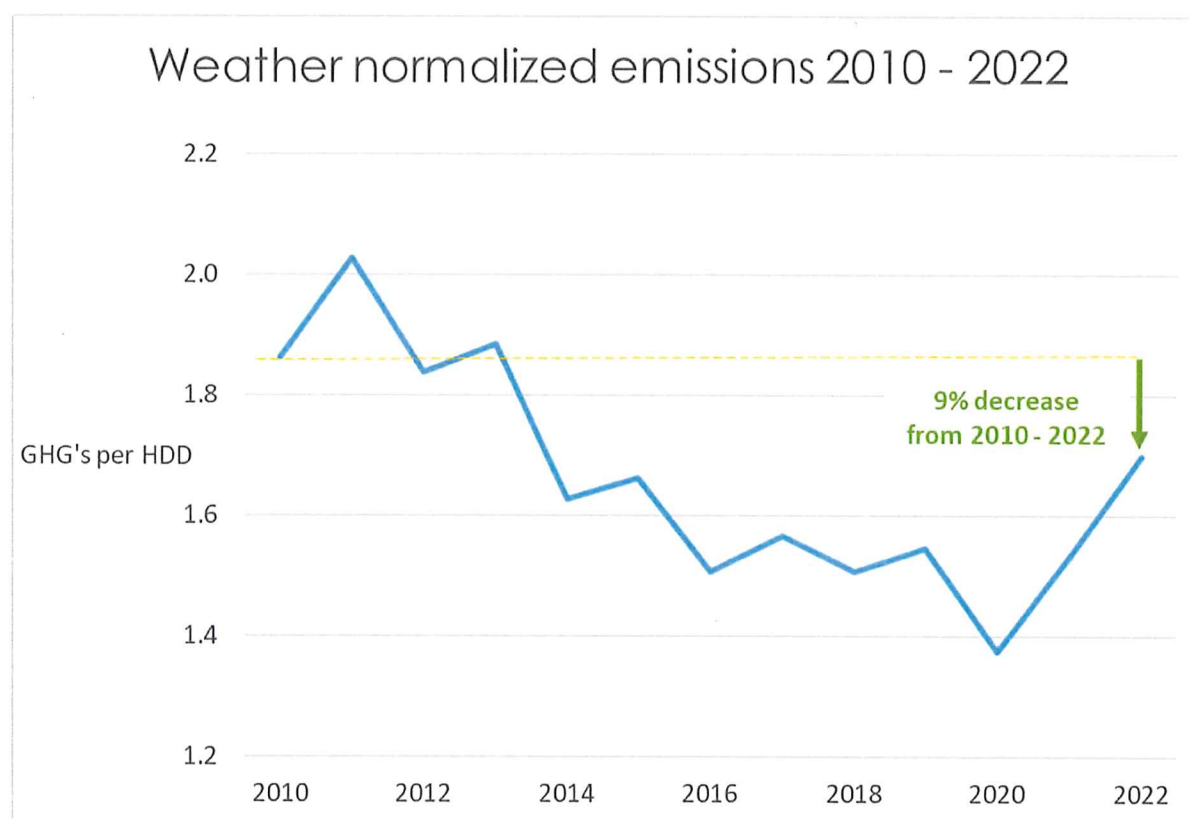


Figure 1. Weather Normalized GHG emissions from 2010- 2022 shown in tCO₂e per Heating Degree Day (HDD)

GHG Emissions by Source

Stationary Sources



Stationary sources accounted for 3,477 tCO₂e or approximately 71% of the District's total 4867 tCO₂e in 2022. This represents the biggest source of GHG emissions in the district. Emissions come from the use of natural gas and electricity for building heating and cooling (Figure 2). 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.

Mobile Sources



The second highest source of GHG emissions in the District is vehicles, which accounted for 1220 tCO₂e or 25% of the District's total emissions in 2022. Mobile emissions come from the fleet of buses the District owns and operates for student transportation as well as from fleet service and administrative vehicles.

Paper



GHG emissions from paper are the smallest source of emissions in the District accounting for only 170 tCO₂e or 4% of the District's total emissions in 2022. Schools are the largest consumer of paper products in the District with the remainder being used by school district administration and support services.

2022 GHG Emissions by Source

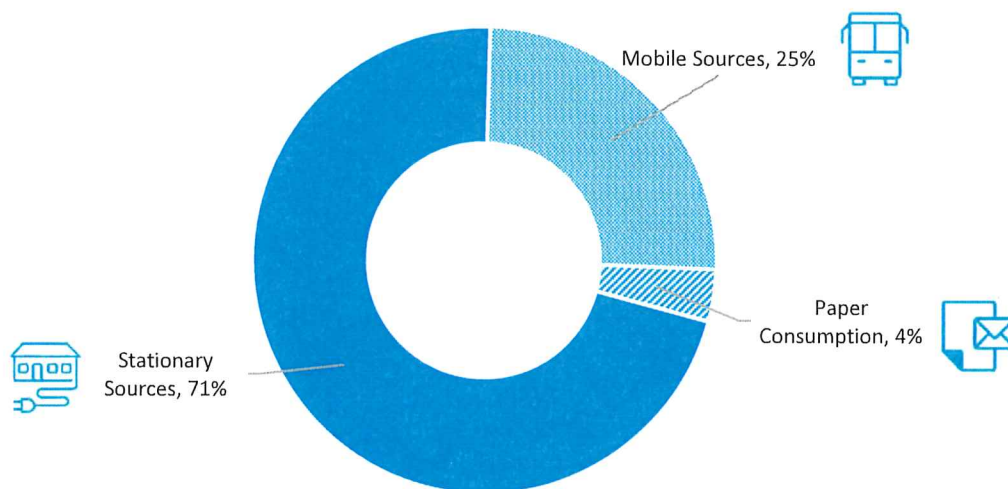


Figure 2. Breakdown of GHG emissions by source in 2022

How Do We Compare?

As of 2021, the Abbotsford School District was one of the ten lowest emitters in the province in terms of GHG emissions per student (Figure 3). Its GHG emissions were less than half the provincial average and fell approximately 4% below the Fraser Valley and Great Vancouver Regional District (FVRD&GVRD) average. Between 2010 – 2021, the District's weather normalized emissions fell by 18% which is compared to the provincial average reduction of 16% and the Fraser Valley and Great Vancouver Regional District average reduction of 10% (Figure 4).

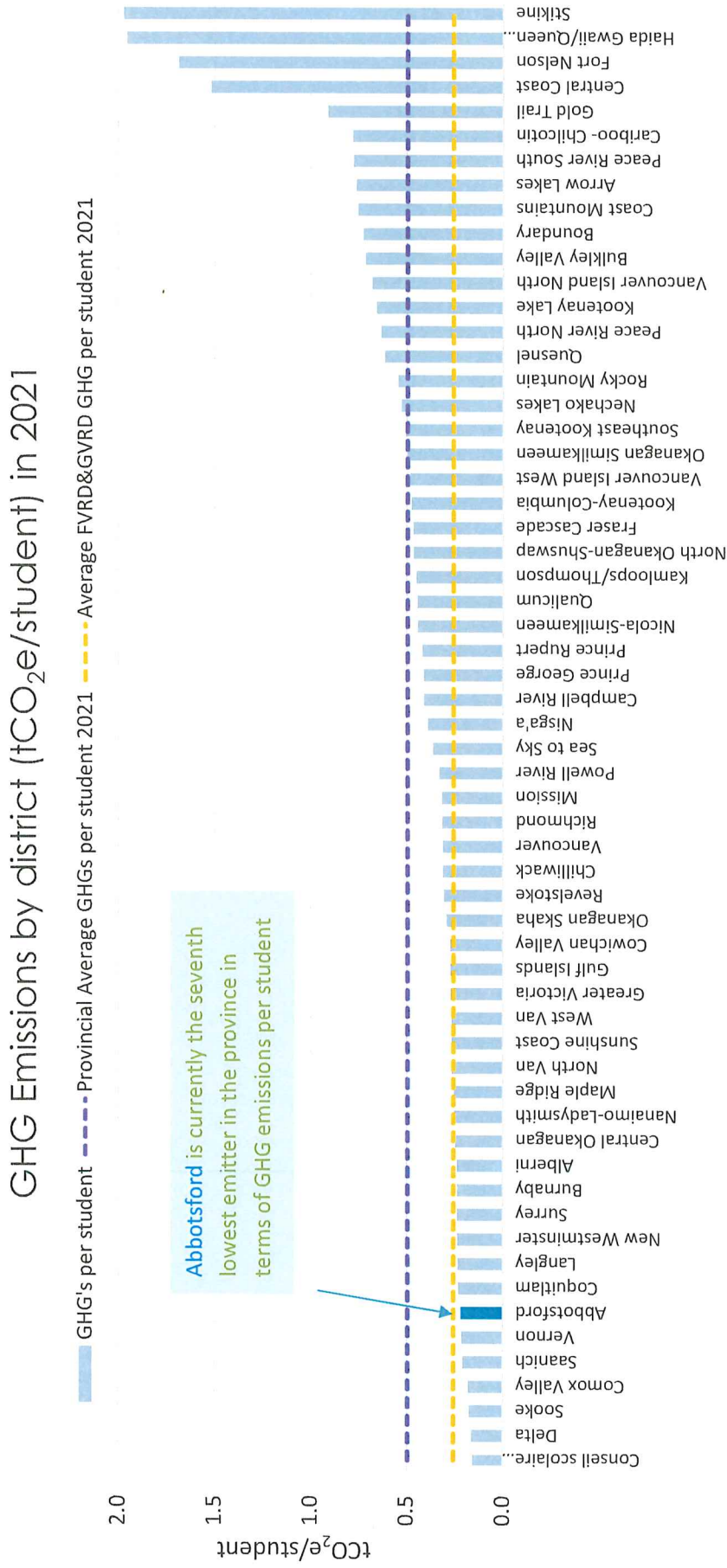


Figure 3. 2021 GHG emissions in tCO₂e per student

Data Sources: This graph was generated using data from CleanBC's 2021 Carbon Neutral Government Year in Review Summary and BC Schools - Student Enrolment and FTE by Grade Report

Percentage change in weather normalized emissions 2010 - 2021

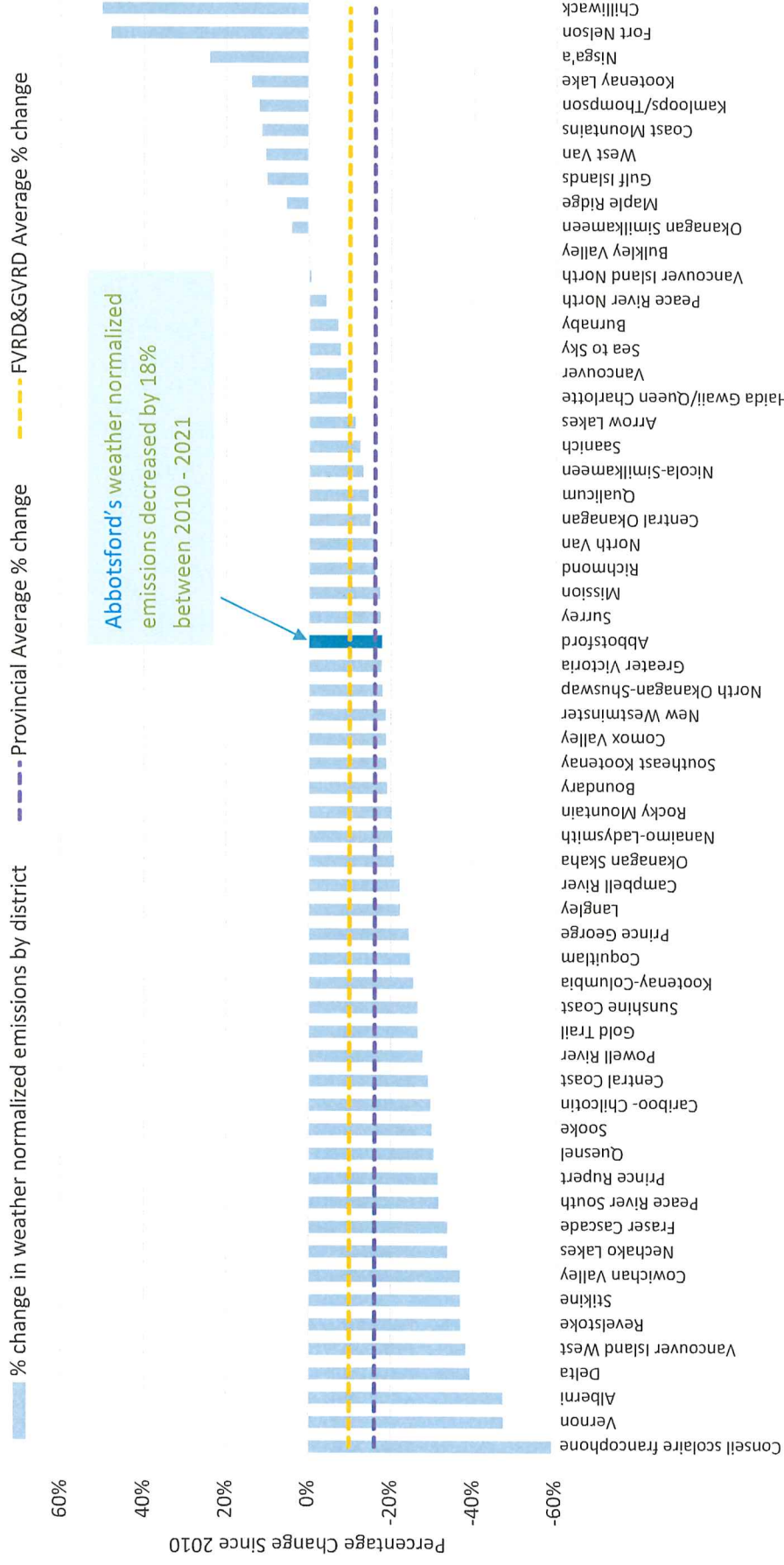


Figure 4. 2021 GHG percentage change in weather normalized GHG emissions per student

Data Sources: This graph was generated using data from CleanBC's 2020 Carbon Neutral Government Year in Review: Summary, and The Government of Canada's historical weather database, https://climate.weather.gc.ca/historical_data/search_historic_data_e.html, accessed May 10, 2023.

Historic Actions Taken to Reduce Greenhouse Gas Emissions

Electricity and Natural Gas Consumption

Abbotsford School District's journey to reduce greenhouse gas emissions began in 2001 when the first energy conservation program was implemented. The District achieved significant reductions in both its electricity and its natural gas consumption between 2001 and 2010 (Figure 5) although GHG emissions were not being tracked at that time. Through a combination of behavior change programs, equipment upgrades and building system optimization, the District reduced electricity consumption by 36% and natural gas consumption by 31% between 2001 and 2010. Since GHG reporting began in 2010, the District has continued to decrease its building energy use, reducing electricity consumption by an additional 8% and natural gas consumption by an additional 6% as of 2022. This results in a total electricity reduction of 41% and a total natural gas reduction of 35% since energy conservation efforts began in 2001. Electricity, natural gas and their associated GHG emissions have risen over the past two years due, in part, to the increased ventilation requirements implemented due to COVID-19.

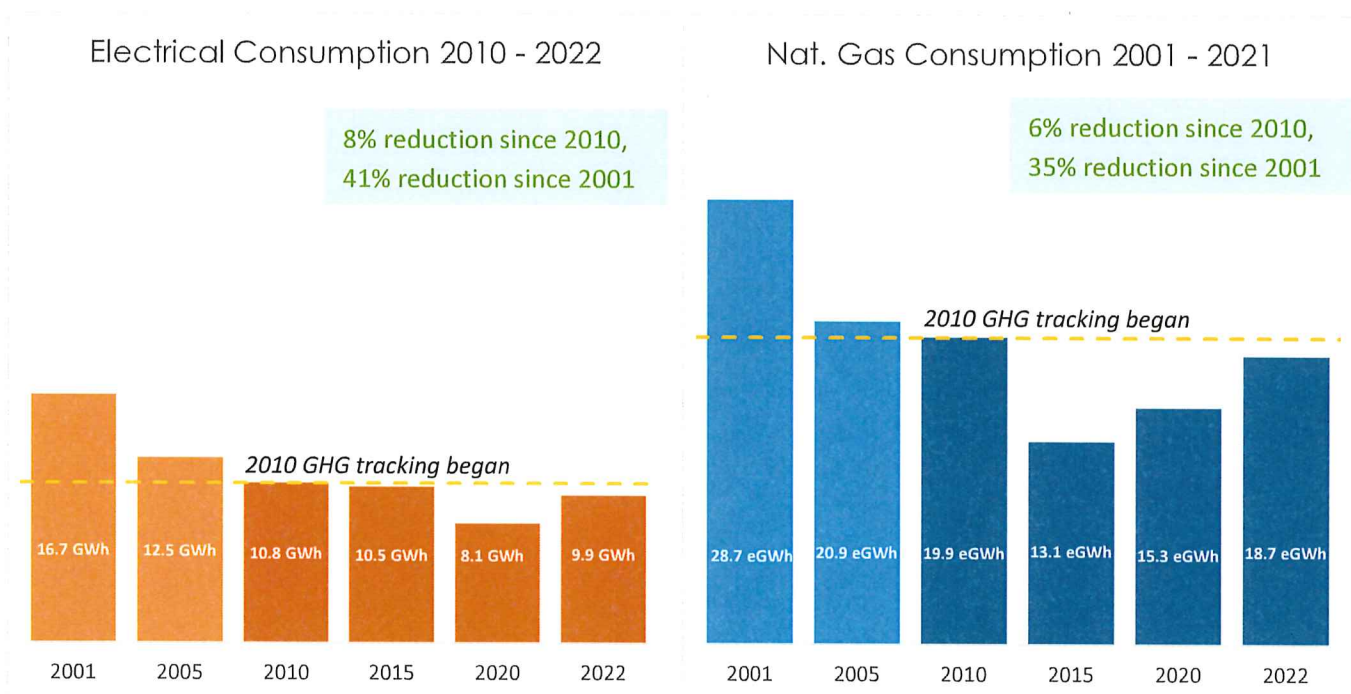
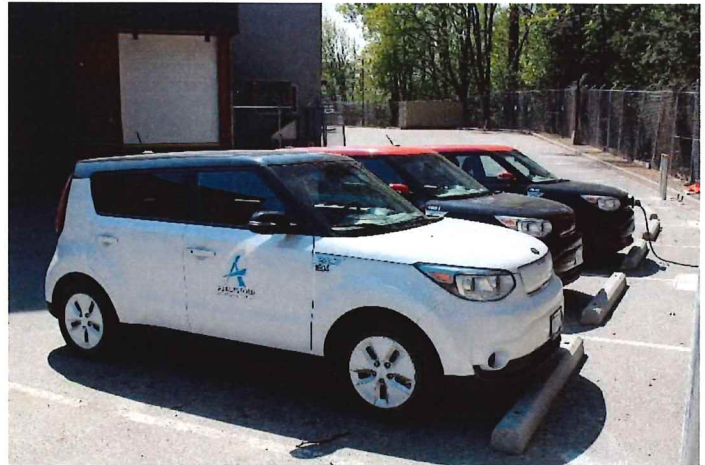


Figure 5. Historic Electricity Consumption Reductions and Historic Natural Gas Consumption Reductions

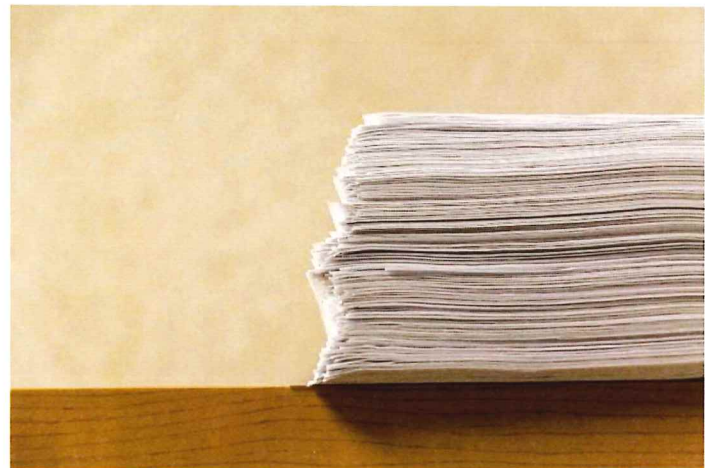
Fleet Vehicles

The District purchased its first battery electric vehicle (BEV) in 2016 and an additional three BEVs in 2018. The District has also installed a network of electric vehicle charging stations throughout the District to facilitate electric fleet vehicle adoption, and to support staff who are making the switch to zero emission vehicles for personal use. While chargers are currently primarily available at middle and secondary schools, the District is gradually expanding the network to elementary schools as well.



Paper

The District has undertaken numerous paper reduction initiatives. At the district level, many forms and procedures have been digitized. At the school level, the IT department is providing teachers, students, and staff with an ever-increasing array of digital resources to help facilitate learning and reduce paper use.



Cost Savings from GHG Reductions

The District's GHG mitigation efforts have resulted in the co-benefit of decreasing operating costs and reducing the amount of carbon offsets the District must invest in each year (Figure 6). The District saves an average of approximately \$500,000 per year in avoided utility costs and has decreased carbon offset costs significantly since 2011 as well. Carbon offset costs were relatively consistent for several years but between 2020 - 2022 carbon offset costs increased by 20% (\$17,600) due, in part, to increased natural gas consumption that resulted from increased COVID-19 ventilation requirements across the District's portfolio of buildings.

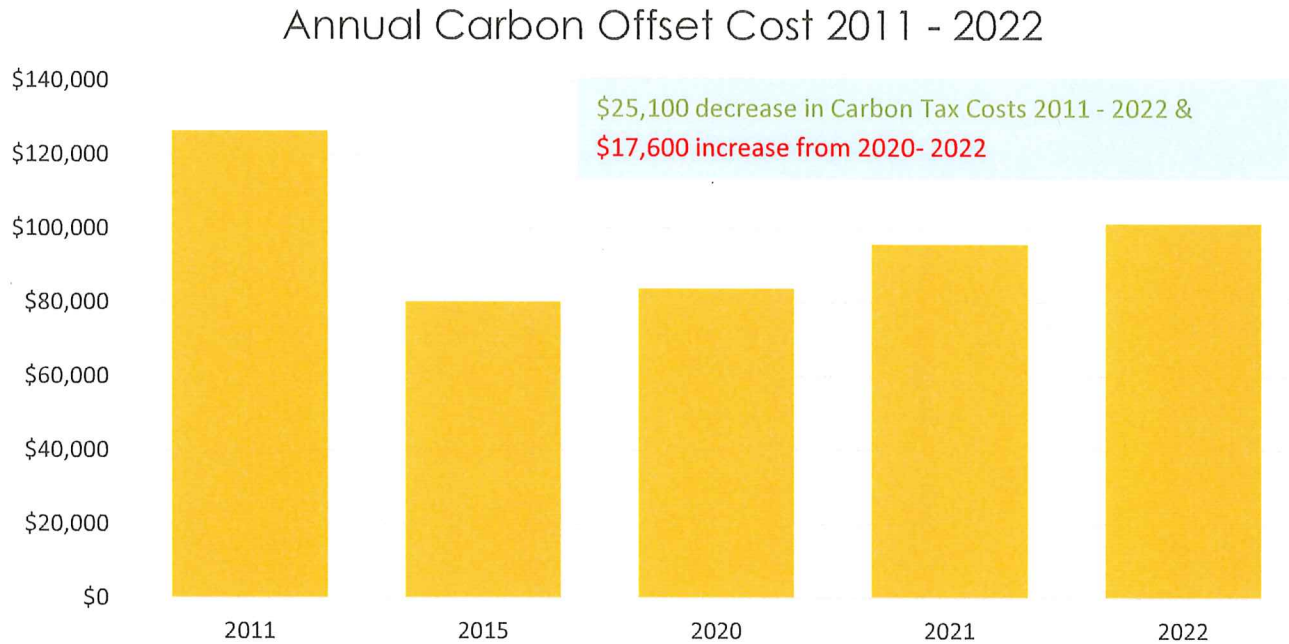




Figure 6. Annual carbon offset costs between 2011 - 2022

Summary of Actions Taken to Reduce Greenhouse Gas Emissions in 2022

Stationary Sources			
Actions Taken			
	Measure Type	Site	Project Description
	Lighting	Abbotsford Traditional Secondary	<ul style="list-style-type: none"> Hallway and classroom lighting was upgraded to LED during the seismic upgrade project.
		Rick Hansen Secondary	<ul style="list-style-type: none"> Phase 2 of a site-wide LED lighting upgrade (including networked lighting controls) was completed. All lighting were completed in 2021 and controls commissioning was completed in 2022.
		Upper Sumas Elementary	<ul style="list-style-type: none"> All lighting in the school was upgraded to LED.
		Various Sites	<ul style="list-style-type: none"> Small Scale LED lighting upgrades were completed at 18 sites.
	Mechanical	Facilities and Transportation Yard	<ul style="list-style-type: none"> Furnace upgraded.
	Building Envelope Upgrades	Abbotsford Traditional Secondary	<ul style="list-style-type: none"> A full envelope upgrade was completed at this site during the seismic upgrade project.
		Ten Broeck Elementary	<ul style="list-style-type: none"> A partial envelope upgrade was completed at this site.
		Bradner Elementary	<ul style="list-style-type: none"> A full envelope upgrade was completed at this site.
	New Construction	Eagle Mountain Elementary	<ul style="list-style-type: none"> Eagle Mountain Elementary was completed in 2022. This site has been designed for high efficiency operations including: <ul style="list-style-type: none"> High efficiency heating and cooling equipment LED lighting throughout Building automation and lighting controls




Mobile Sources 			
Actions Taken	Measure Type	Site	Project Description
	EV's and EV infrastructure	Godson Elementary, John MacLure Elementary, Centennial Park Elementary, McMillian Elementary	<ul style="list-style-type: none"> Two level 2 EV chargers were added at each site to increase the District's charging network.

Paper Consumption 	
Actions Taken	<ul style="list-style-type: none"> All printers and photocopiers were outfitted with PaperCut print management software and tied into the District's network of printers and photocopiers. This program will go live in 2023.

GHG Reduction Actions Planned for 2023

To continue reducing its GHG emissions the District is planning to complete the following projects in 2023:

Stationary Sources 			
Actions Planned	Measure Type	Site	Project Description
	Lighting	WJ Mouat Secondary	<ul style="list-style-type: none"> LED lighting upgrades for the Gyms
	Electrical Infrastructure	Bradner Elementary Godson Elementary Ten Broeck Elementary	<ul style="list-style-type: none"> Electrical Service upgrades to modernize and increase capacity
	Mechanical	Mountain Elementary	<ul style="list-style-type: none"> Boiler upgrade
		John MacLure Elementary	<ul style="list-style-type: none"> Boiler upgrade
		Margaret Stenersen Elementary	<ul style="list-style-type: none"> Boiler upgrade

Building Envelope Upgrades	Rick Hansen Secondary	<ul style="list-style-type: none"> Boiler upgrade Chiller upgrade
	WJ Mouat Secondary	<ul style="list-style-type: none"> Rooftop Unit Replacement
	Terry Fox Elementary	<ul style="list-style-type: none"> Heat pump replacement
	Blue Jay Elementary	<ul style="list-style-type: none"> Partial envelope upgrade
	Dave Kandal Elementary	<ul style="list-style-type: none"> Partial envelope upgrade
	South Poplar Elementary	<ul style="list-style-type: none"> Partial envelope upgrade

Mobile Sources



Actions Planned	EV's and EV infrastructure <ul style="list-style-type: none"> Three electric passenger vehicles will be added to the fleet this year to replace end-of-life gas passenger vehicles in the IT Department.
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Paper Consumption



Actions Planned	<ul style="list-style-type: none"> In the Fall of 2023, the District will implement PaperCut print management at all sites to reduce abandoned print jobs and decrease paper consumption by an estimated 25%.
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Emissions and Offset Summary Table

Abbotsford School District 2022 GHG Emissions and Offsets	
GHG Emissions created in Calendar Year 2022	
Total Emissions (tCO ₂ e)	4867 tCO ₂ e
Total BioCO ₂	50.8 tCO ₂ e
Total Offsets (tCO ₂ e)	4057 tCO ₂ e
Adjustments to Offset Required GHG Emissions Reported in Prior Years	
Total Offset Adjustment (tCO ₂ e)	0 tCO ₂ e
Grand Total Offsets for the 2022 Reporting Year	
Grand Total Offsets (tCO ₂ e) to be Retired for 2021 Reporting Year	4057 tCO ₂ e
Offset Investment (\$25 per tCO ₂ e)	4057x \$25 = \$101,433

Retirement of Offsets

In accordance with the requirements of the *Climate Change Accountability Act* and Carbon Neutral Government Regulation, *the Abbotsford School District – SD34 (the Organization)* is responsible for arranging for the retirement of the offsets obligation reported above for the 2022 calendar year, together with any adjustments reported for past calendar years (if applicable). The Organization hereby agrees that, in exchange for the Ministry of Environment and Climate Change Strategy (**the Ministry**) 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.

Climate Change Risk Management

Based on a high-level climate hazard assessment conducted by the District 5 years ago and climate hazard impacts experienced by in recent years, the District has begun looking at ways to adapt to current and future climate hazards. The District has also added an explicit climate change hazard metric to its annual risk registry for facilities and operations.

Thus far, the District has been most impacted by and has begun working towards adapting to two main hazards, namely, rising temperatures and extreme rain events. This section summarizes the impacts experienced in 2022 and the planned or implemented adaptation measures for these two hazard categories.

Climate Change Impacts and Adaptation Measures by Hazard Category

Rising annual temperatures and more frequent extreme heat events



2022 Impacts

No significant impacts from extreme heat events were recorded in 2022. However, anecdotal data from past school years indicates there may be an increased need for cooling at some sites as local temperatures begin to rise, particularly in the months of June to September.



Flooding from prolonged or extreme rain events

2021/ 2022 Impacts

Local flooding had a significant impact on the Abbotsford School District in the Fall of 2021 and spring of 2022. Two schools had to be shut down and numerous others had lesser impacts such as field flooding which impacted regular operations.

One of the closed sites, Barrowtown Elementary, was able to reopen after a couple of weeks as luckily the primary flood damage was in the crawlspace and grounds. The cost impacts for flooding remediation at this site were approximately \$75,000.

The second closed site, Upper Sumas Elementary, had to remain closed for almost five months (November 2021 – March 2022) while full scale remediation work was completed throughout the entire lower floor of the school. During this time students and staff had to be relocated to another facility. The cost impacts of flood remediation at this site totalled \$1,200,000. See “Success Story” below to learn more about this remediation project.

2022 Adaptation Measures Implemented

Actions Taken	Hazard Type	Site	Adaptation Measure Description
	Rising Annual Temperatures and Extreme Heat Events	Abbotsford Middle	<ul style="list-style-type: none"> Optimized the geothermal heat pump system to provide energy efficient, low carbon cooling and heating.
		ASIA Sumas Middle	<ul style="list-style-type: none"> Replaced one rooftop unit with a heat pump that can provide energy efficient cooling and heating.
		Ten Broeck Elementary	<ul style="list-style-type: none"> Replaced five rooftop units with heat pumps that can provide energy efficient cooling and heating.
		McMillan Elementary	<ul style="list-style-type: none"> Installed a rooftop cooling unit.
	Flooding from prolonged or extreme rain events	Upper Sumas Elementary	<ul style="list-style-type: none"> Upgraded perimeter drains.

2023 Adaptation Measures Planned

Actions Planned	Hazard Type	Site	Adaptation Measure Description
	Rising Annual Temperatures and Extreme Heat Events	Aberdeen Elementary	<ul style="list-style-type: none"> New unit ventilators will be added to provide ventilation.
		Chief Dan George	<ul style="list-style-type: none"> Four rooftop units will be replaced with heat pumps that can provide low carbon heating and cooling.

Other Sustainability Initiatives



Waste reduction

The District has an established waste diversion system in place which facilitates the sorting of waste from recycling and compostables at all facilities. Some sites also have additional recycling collection initiatives in place to collect items such as batteries, used pens and markers, or soft plastics (all of which cannot currently be placed in mixed recycling bins) and bring them to local recycling facilities.



Green Procurement

The District purchasing department has instituted a buy local purchasing initiative and strives to purchase supplies and materials within a 100km radius whenever possible.

Success Story



Creating the Silver Lining

Upper Sumas Elementary

In the fall of 2021 prolonged heavy rain events lead to the wide scale flooding of much of the City of Abbotsford and neighbouring municipalities. While many schools in the Abbotsford School District were impacted by this event one in particular, Upper Sumas Elementary, sustained significant flood damage. The extent of the damage was such that students and staff had to be relocated to another facility for several months while repairs were undertaken. Luckily thanks to the efforts of district staff a temporary school site was quickly located and stocked with the furniture and supplies needed for students and staff to start learning and teaching once more.

Meanwhile, the facilities and maintenance department used this opportunity to not only restore the school to working order but to make significant improvements to the interior of the school and to upgrade the perimeter drainage system to help increase the flood resiliency of the site in future extreme rain events. Despite tight timelines and a complex and dynamic work environment, district maintenance staff, the restoration company and various contractors all worked together to turn Upper Sumas Elementary back into a safe, healthy place for students and staff to work and learn. Improvements to the school that were completed over the course of this project included:

- The installation of a new Pulastic gym floor,
- The installation of energy efficient LED lighting throughout the building,
- Repainting of the entire interior of the school
- The addition of MDF to classroom and hallway walls to increase durability,
- The replacement of all millwork in all first story rooms with new in-house built millwork
- Upgrading of the sites perimeter drainage system

The district was able to create a silver lining for an unexpected and potentially disastrous event by using it as an opportunity to build back better and complete improvements that will make the school an even better place for student learning for years to come.



Abbotsford School District

March 23, 2022 · 🌐

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In November 2021, Upper Sumas Elementary was damaged by the floods that impacted [#Abbotsford](#). Students and staff have been at a temporary site for months while appropriate remediation and repairs occurred.

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This week, Superintendent Godden and Secretary-Treasurer Velestuk stopped by Upper Sumas Elementary for a tour before students return to class next week. New paint, flooring, millwork and lighting have been updated - and so much more... ✨

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Thank you to our Upper Sumas Elementary staff and families for your resolve through these challenging times. And THANK YOU to our incredible [#AbbySchools](#) Facilities Department for months of hard work at the site to ensure it's ready for our students. We can't wait to see their smiles back in these hallways. ❤️



👍❤️ 212

7 comments 11 shares

Executive sign-off


Ray Velestuk (May 18, 2023 09:53 PDT)

May 18, 2023

Signature	Date
Ray Velestuk	Secretary-Treasurer
Name (please print)	Title

Please scan and email the completed form to Carbon.Neutral@gov.bc.ca