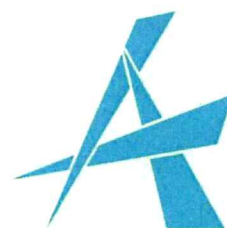




PSO Climate Change Accountability Report | 2021



ABBOTSFORD
SCHOOL DISTRICT
RESPECT OPPORTUNITY INNOVATION

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Declaration statement

This PSO Climate Change Accountability Report for the period January 1, 2021 to December 31, 2021 summarizes our greenhouse gas (GHG) emissions profile, the total offsets to reach net-zero emissions, the actions we have taken in 2021 to reduce our GHG emissions, and our plans to continue reducing emissions in 2022 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 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 2021, the District reduced its GHG emissions from stationary sources and paper consumption. Stationary emissions were reduced by lowering energy consumption. Small scale LED lighting upgrades at numerous sites and phase 2 of a site-wide networked controlled LED lighting pilot project at Rick Hansen Secondary School helped to reduce electricity consumption. Building Envelope upgrades were also completed at three sites to improve buildings' thermal performance, reduce energy consumption for heating, improve occupant comfort, and increase the assets useful lifespans. Paper consumption was reduced through the finance department's efforts to go paperless.

In 2022, the District will continue reducing GHG emissions in several ways. The construction of Eagle Mountain Elementary School will be completed in 2022 as will a major renovation Abbotsford Traditional Secondary School. Both projects are designed for energy efficient operations. Other buildings upgrades include the installation of low carbon heat pumps in place of rooftop units, numerous LED lighting upgrades, high efficiency boilers and building envelop improvements. In addition, sites are being encouraged to go paperless for all administrative tasks and the District continues to install PaperCut print management software to reduce paper waste from abandoned printing.

The District is also making progress with regards to reducing climate change related risks. In response to a high-level climate change hazard assessment completed three years ago and ASHRAE's pandemic ventilation recommendations, the District has begun looking at ways to deliver ventilation and cooling to portables and buildings which were not previously equipped to do so. These measures will help ensure that the District can continue to provide safe, healthy learning environments despite increasing global temperatures or in the event of another global pandemic.

2021 also saw the District and the City of Abbotsford significantly impacted by a flooding event caused by extreme precipitation. This event caused over a million dollars in damage and negatively impacted the District's ability to deliver its core services at the time. The District has plans in place to improve the perimeter drainage at Upper Sumas Elementary (the school most impacted by the flooding) to reduce the risks associated with flooding at this site in the future.

2020 Greenhouse Gas Emissions Overview

Current State of the Inventory

As of 2020, the Abbotsford School District had reduced its GHG emission by 9% in terms of absolute emissions and 20% in terms of weather normalized GHG emissions (Figure 1). This falls 14% 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 this year as a direct result of the increased ventilation requirements issued by ASHRAE in response to COVID-19.

The projects undertaken in 2021 and those planned for 2022 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.

Weather Normalized Emissions 2010 - 2021

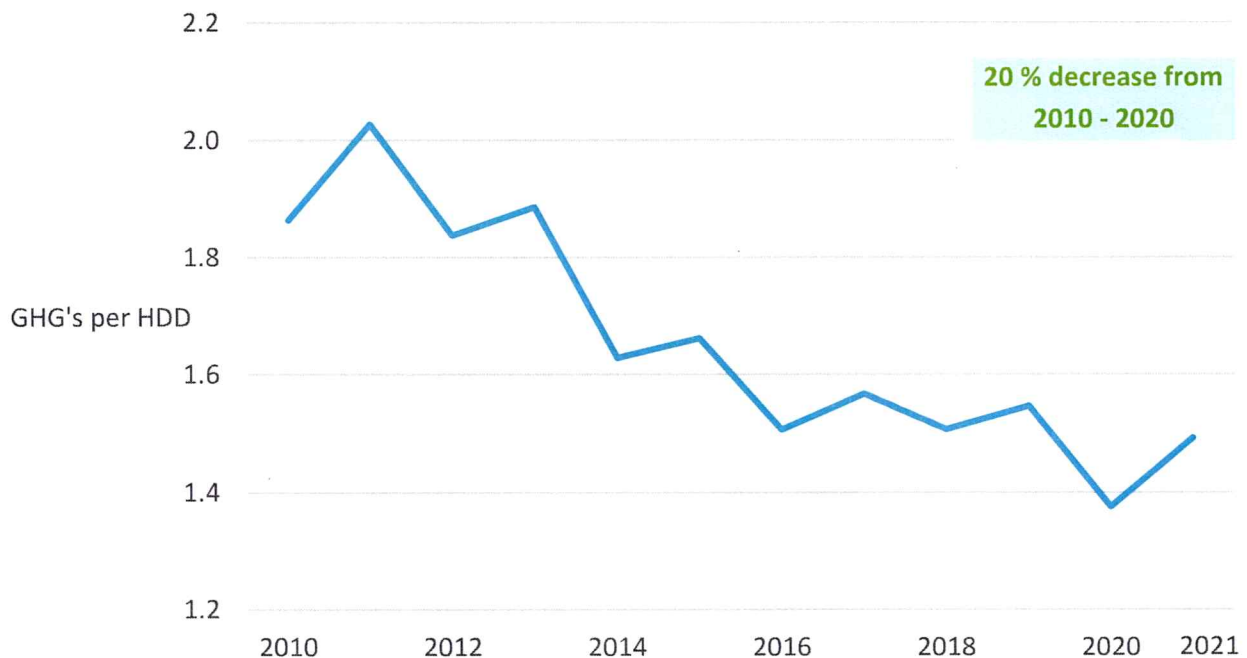


Figure 1. Weather normalized GHG emissions (tCo2e) from 2010 -2021

GHG Emissions by Source



Stationary Sources

Stationary sources accounted for 3131 tCO₂e or approximately 72% of the District's total 4347 tCO₂e in 2021. 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 1059 tCO₂e or 24% of the District's total emissions in 2021. 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 157 tCO₂e or 4% of the District's total emissions in 2021. Schools are the largest consumer of paper products in the District with the remainder being used by school district administration and support services.

2021 GHG Emissions by Source

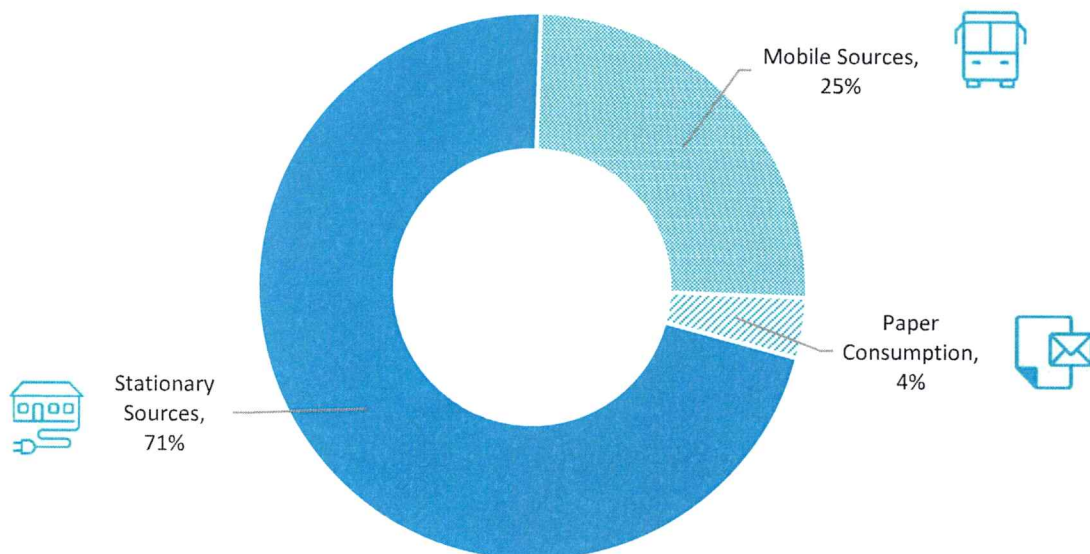


Figure 2. Breakdown of GHG emissions by source in 2021

How Do We Compare?

As of 2020, the Abbotsford School District was the sixth lowest emitter 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 5% below the Fraser Valley and Great Vancouver Regional District (FVRD&GVRD) average as well. Between 2010 – 2020 the District’s weather normalized emissions fell by 26% which is compared to the provincial average reduction of 21% and the Fraser Valley and Great Vancouver Regional District average reduction of 15% Figure 4).

GHG Emissions by District (tCO₂e/student) in 2020

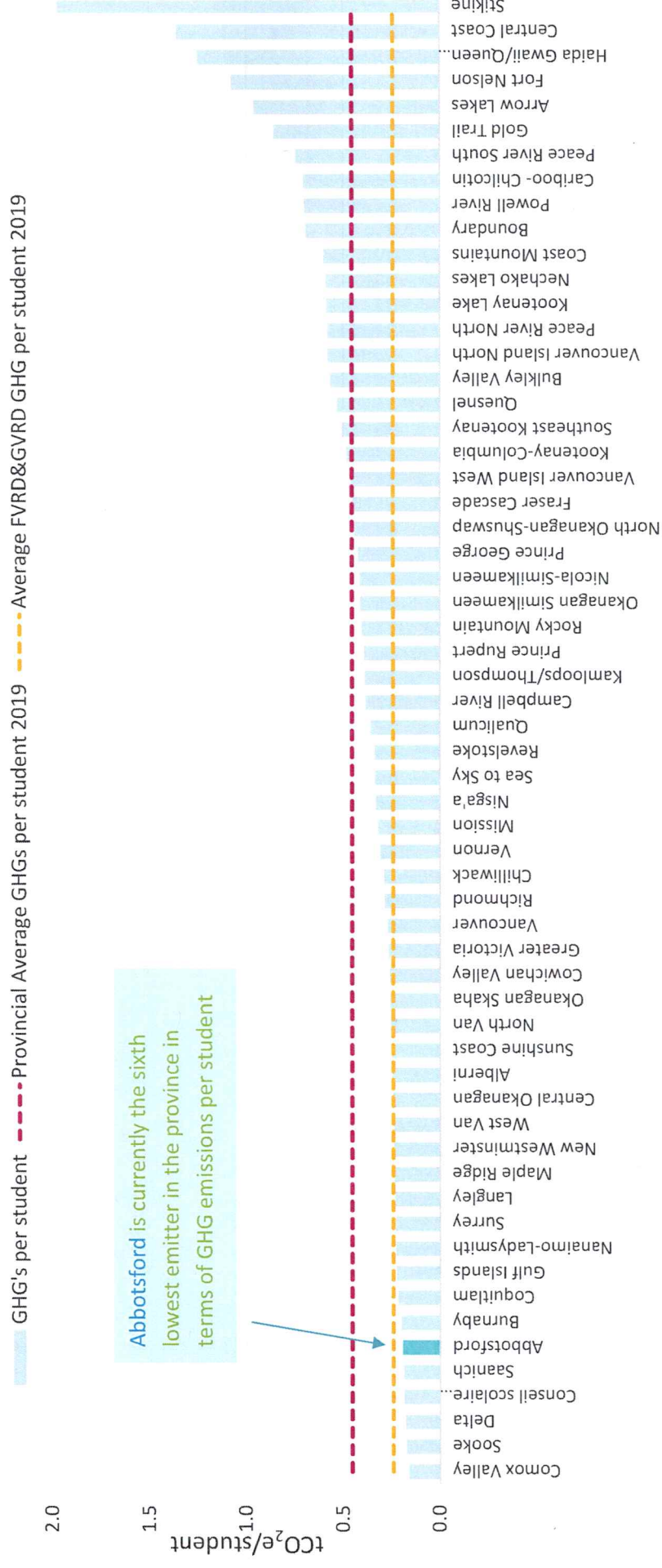


Figure 3. 2020 GHG emissions in tCO₂e per student

Data Sources: This graph was generated using data from CleanBC’s 2020 Carbon Neutral Government Year in Review Summary and BC Schools - Student Enrolment and FTE by Grade Report

Percentage Change in Weather Normalized Emissions 2010 - 2020

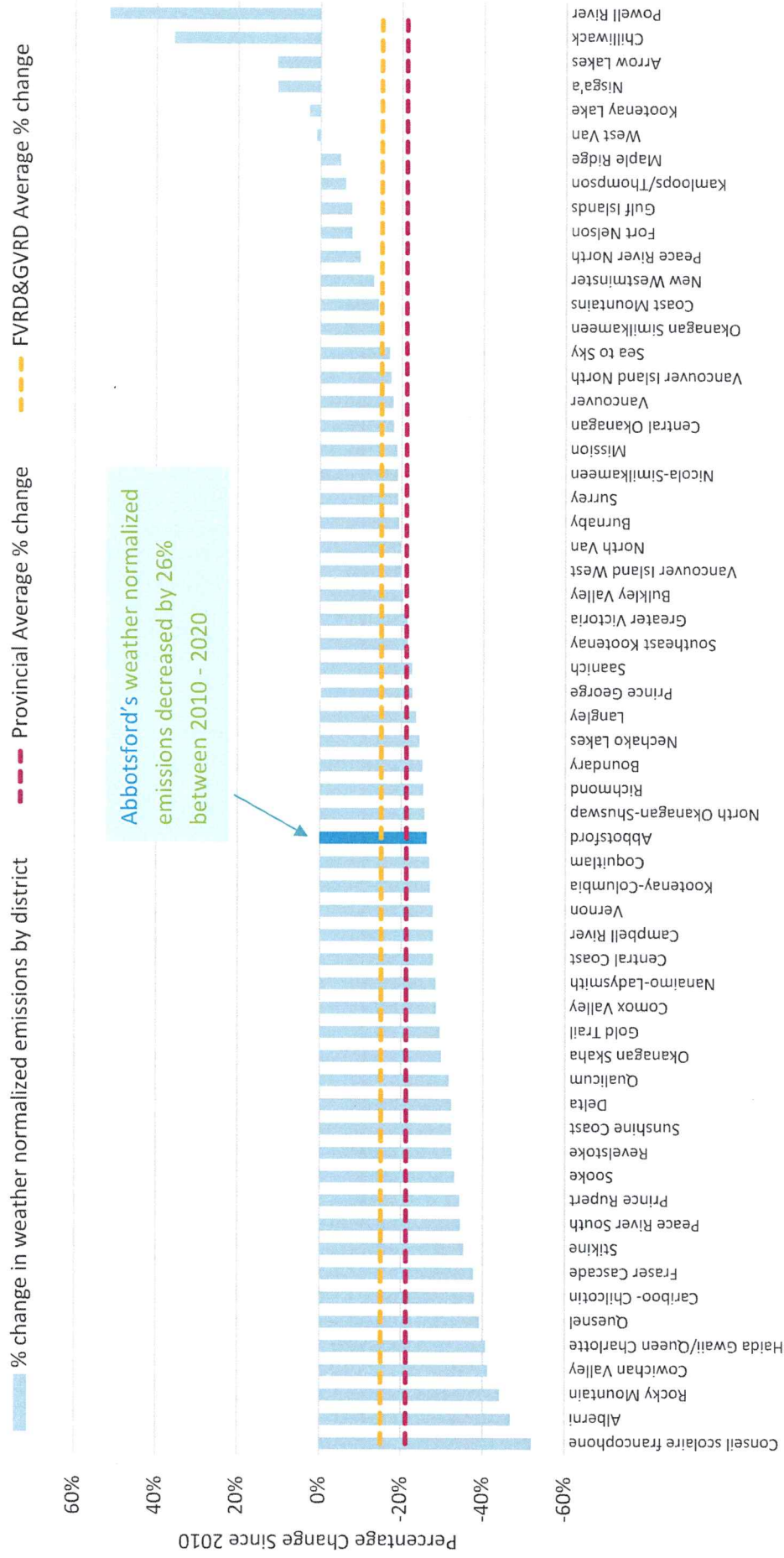


Figure 4. 2020 GHG percentage change in weather normalized GHG emissions per student

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 12, 2022

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 5a & 5b*) 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 steadily decrease its building energy use reducing electricity consumption by an additional 13% and natural gas consumption by an additional 14% as of 2021. This results in a total electricity reduction of 44% and a total natural gas reduction of 40% since energy conservation efforts began in 2001.

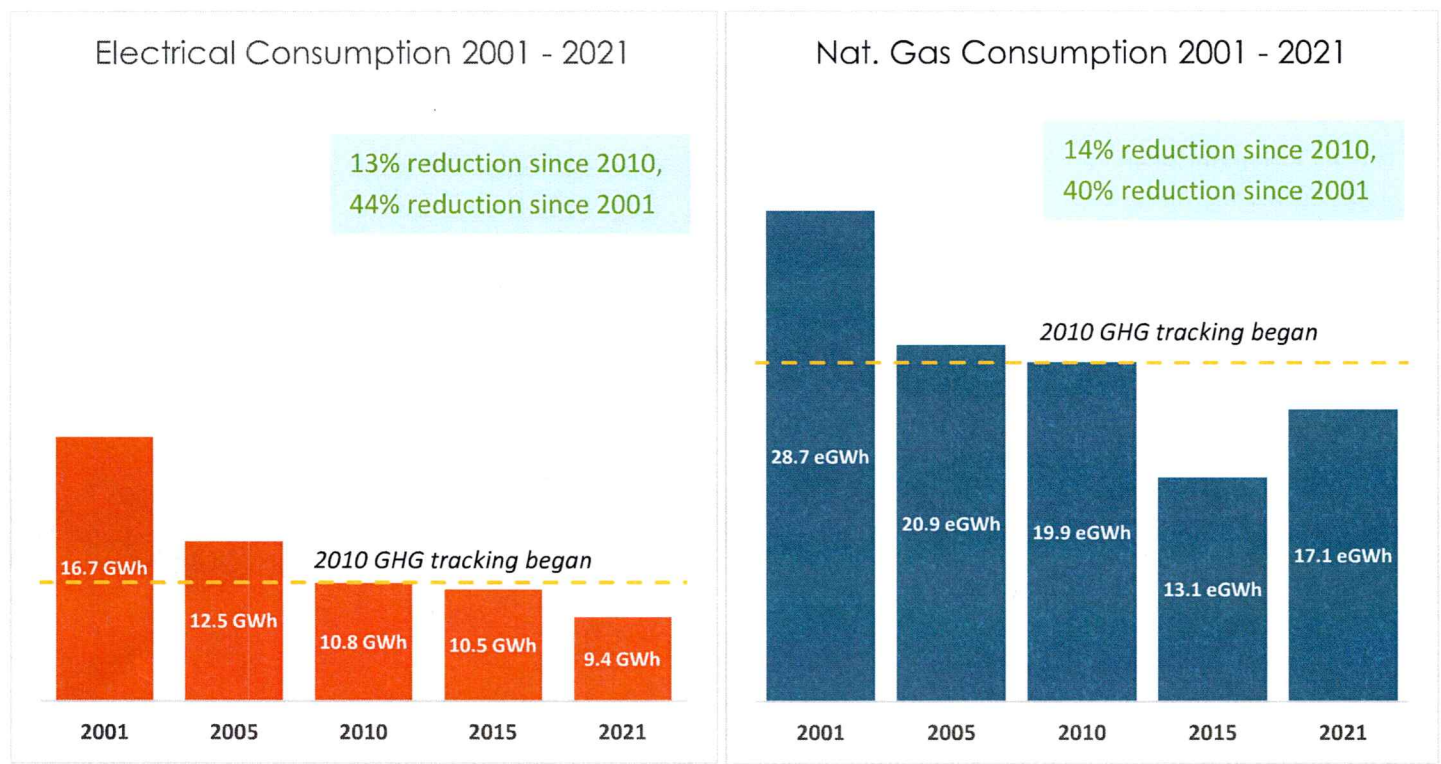


Figure 5a – Historic Electricity Consumption Reductions, Figure 5b - Historic Natural Gas Consumption Reductions

COVID- 19 Impacts

There was a noticeable increase in natural gas consumption and its associated GHG emissions from natural gas in 2020 and 2021. This was a direct result of increased ventilation requirements at all sites because of COVID-19. Electricity consumption was also impacted by these increased ventilation requirements although to a lesser degree. Furthermore, decreases in plug load and the District’s continued efforts to reduce electricity consumption through LED lighting upgrades helped to compensate for the additional ventilation related electric load. The District is currently working to optimize ventilation requirements to comply with ASHRAE’s latest ventilation requirements in the most energy efficient manner possible.

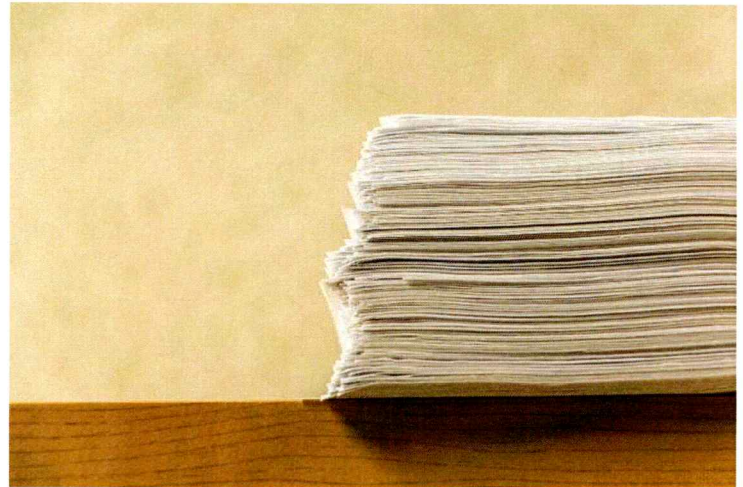
Fleet Vehicles

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 and the District has adopted a print management software program that helps to reduce abandoned printing by 20-30%. 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. 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 have been relatively consistent for several years but in 2021 carbon offset costs increased by 14% primarily due to increased natural gas consumption that resulted from increased ventilation requirements across the District’s portfolio of buildings. The District has plans in place to help reduce this cost increase in 2022 by optimizing site ventilation to meet the new ventilation requirements in a more energy efficient manner.

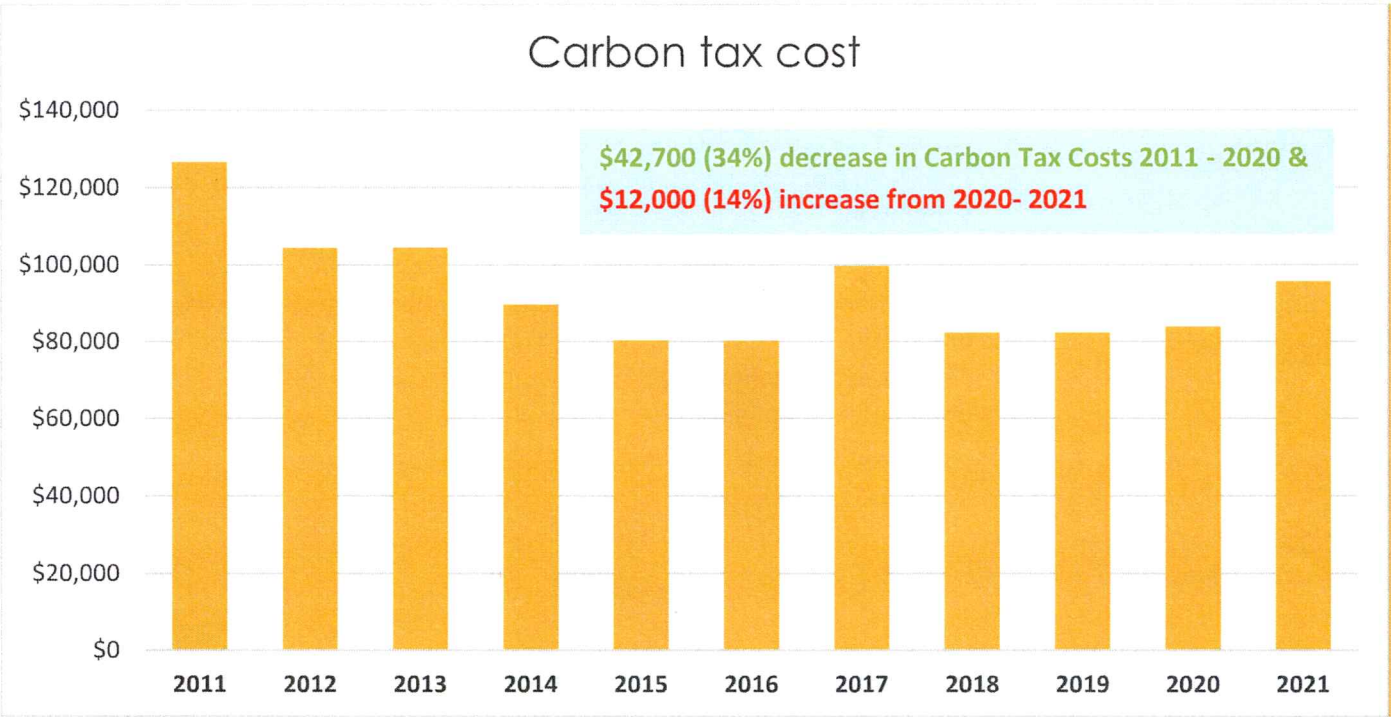




Figure 6. Falling carbon offset costs between 2011 - 2020 due to GHG emission reduction efforts


Summary of Actions Taken to Reduce Greenhouse Gas Emissions in 2021

| Stationary Sources  | | |
|--|----------------------------|---|
| Actions Taken | Lighting | <ul style="list-style-type: none"> Phase 2 of a site-wide LED lighting upgrade (including networked lighting controls) completed at Rick Hansen Secondary School – Project is underway with all lighting completed in 2021 and controls commissioning scheduled for completion in 2022. <ul style="list-style-type: none"> The projected savings for the LED lighting and controls upgrade at this site are 150,00kWh/yr. Small Scale LED lighting upgrades at 30 sites |
| | Mechanical | <ul style="list-style-type: none"> Furnace upgrade at Facilities and Transportation Yard Aberdeen Elementary School - new unit ventilators were added to provide ventilation |
| | Building Envelope Upgrades | <ul style="list-style-type: none"> Abbotsford Traditional Secondary School (started in 2021 to be completed in 2022) Ten Broeck Elementary Bradner Elementary |

| Paper Consumption  | |
|---|--|
| Actions Taken | <ul style="list-style-type: none"> The finance department worked towards becoming completely paperless this year. Sites have been supplied with scanners to avoid the need to send in paper receipts which helps to avoid transportation emissions and all sites are being encouraged to go paperless for all administrative tasks. All printers and photocopiers replaced in 2021 were outfitted with PaperCut print management software and tied into the District's network of printers and photocopiers. |

GHG Reduction Actions Planned for 2022

To continue reducing its GHG emissions the District is planning to complete the following projects in 2022:

| Stationary Sources | |  |
|--------------------|---------------------------------------|---|
| Actions Planned | Lighting | <ul style="list-style-type: none">• Abbotsford Traditional Secondary School hallway and classroom lighting is being upgraded to LED during the seismic upgrade project happening at this site. Project completion is scheduled for late 2022.• Phase 2 of a site-wide LED lighting upgrade (including networked lighting controls) will be completed at Rick Hansen Secondary School. The project is underway with all lighting completed in 2021 and controls commissioning scheduled for completion in 2022.<ul style="list-style-type: none">○ The projected savings for the LED lighting and controls upgrade at this site are 150,00kWh/yr• Upper Sumas Elementary School – All lighting in the school will be upgraded to LED• Small Scale LED lighting upgrades at 18 sites |
| | Mechanical | <ul style="list-style-type: none">• Abbotsford Traditional Secondary School - new high efficiency boilers and unit ventilators will replace the old lower efficiency units. All rooftop units will also be replaced with modern equipment. This project is being undertaken in conjunction with the seismic upgrade and project completion is scheduled for late 2022.• Auguston Elementary School – existing roof top unit will be replaced with a dual-fuel rooftop unit• School Board Office – existing boiler will be upgraded to a high-efficiency unit• Terry Fox Elementary – end of life water to air heat pumps will be upgraded to high efficiency heat pumps. Heating system controls will also be upgrade to facilitate system optimization and centralized control. |
| | Building Envelope and Window Upgrades | <ul style="list-style-type: none">• Abbotsford Traditional Secondary School (started in 2021 to be completed in 2022)• South Poplar Elementary School |
| | New building | <ul style="list-style-type: none">• Eagle Mountain Elementary will be completed in 2022<ul style="list-style-type: none">○ This site will be 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 Planned

EV's and EV infrastructure

- Three electric passenger vehicles will be added to the fleet this year to replace end-of-life gas passenger vehicles
- Eight more level 2 charging stations will be added (2 heads each at 4 sites) to increase the District's charging network
- Upper Sumas Elementary School – All lighting in the school will be upgraded to LED
- Small Scale LED lighting upgrades at 18 sites

Paper Consumption



Actions Planned

- All sites are being encouraged and supported to go paperless for all administrative tasks.
- All printers and photocopiers replaced in 2022 will be outfitted with PaperCut print management software and tied into the District's network of printers and photocopiers.

Emissions and Offset Summary Table

| Abbotsford School District 2021 GHG Emissions and Offsets | |
|---|---|
| GHG Emissions created in Calendar Year 2021 | |
| Total Emissions (tCO ₂ e) | 4393 tCO ₂ e |
| Total BioCO ₂ | 33.3 tCO ₂ e + 11.9 tCO ₂ e = 45.2 tCO ₂ e |
| Total Offsets (tCO ₂ e) | 3649 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 2021 Reporting Year | |
| Grand Total Offsets (tCO ₂ e) to be Retired for 2021 Reporting Year | 3649 tCO ₂ e |
| Offset Investment (\$25 per tCO ₂ e) 3,309 tCO ₂ e x \$25/tCO ₂ e | 3649 x \$25 = \$91,225 |

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 2021 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 3 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 2021 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



2021 Impacts

No significant impacts from extreme heat events were recorded in 2021. 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 - September.

Adaptation Measures

2021 Adaptation Measures Implemented

- Godson Elementary - Ventilation was added in the form of a series of additional exhaust fans and classroom door grills. This helped to increase airflow in response to COVID-19 ventilation requirements and has the co-benefit of improving the site's ability to mitigation temperature complaints through increased air circulation.
- Cooling tower upgrades were completed at the following sites to ensure that existing cooling systems remain fully functional:
 - WJ Mouat Secondary School
 - School Board Office
 - Dr. Thomas Swift Elementary School
- Abbotsford Middle School – Added a cooling coil to Fan Coil Unit #4 in order to provide cooling as well as heating for the building space this unit services.
- Facilities Maintenance Building - Installed one rooftop air conditioning unit and one heat pump to provide cooling in some sections of the building.

2022 Adaptation Measures Planned

- Abbotsford Middle School - Optimize the geothermal heat pump system to provide energy efficiency cooling and heating.
- ASIA Sumas Middle School – Replace one rooftop unit with a heat pump that can provide energy efficiency cooling and heating.
- Ten Broeck Elementary School – Replace five rooftop units with heat pumps that can provide energy efficiency cooling and heating.
- McMillan Elementary - Install a rooftop cooling unit.

Flooding from prolonged or extreme rain events



2021 Impacts

Local flooding had a significant impact on the Abbotsford School District in the Fall of 2021. 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 was able to reopen after a couple of weeks. The other, Upper Sumas Elementary, had to remain closed for almost five months (Nov 2021 – March 2022) while full scale remediation work was completed throughout the entire lower floor of the school. The cost impacts of this flooding are still being finalized but are currently estimated to be over one million dollars.

Adaptation Measures

Actions
Planned

2022 Adaptation Measures Planned

- Upgrade perimeter drains at Upper Sumas Elementary

Other Sustainability Initiatives



Waste reduction

The District has an establish 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 Stories

In 2021 the District undertook three building envelope upgrades. These types of projects have multiple benefits including climate change mitigation and adaptation, increased occupant comfort, increased asset lifespan, and improved building aesthetics. Building envelope upgrades provide an opportunity to seal air leaks, improve or replace insulation, reduce thermal bridging and generally improve the overall thermal performance of the building. This in turn helps to reduce the building’s heating and cooling load resulting in lower energy consumption. In addition, improved thermal performance helps to make the building more resilient to extreme temperatures and improves occupant comfort by eliminating drafts and improving the building HVAC system’s ability to maintain a more consistent temperature throughout the building. The District will continue to building upon this success by completing an additional building envelope upgrade in 2022.

Executive sign-off



Signature

May 30/22

Date

RAY VELESLUK

Name (please print)

SECRETARY-TREASURER

Title

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