2021 Climate Change Accountability Report

Greater VICTORIA School District — One Learning Community

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Declaration Statement:

This Climate Change Accountability Report for the period January 1, 2021 to December 31, 2021 summarizes our emissions profile, the total offsets to reach net-zero emissions, the actions we have taken in 2021 to reduce our greenhouse gas emissions and our plans to continue reducing emissions in 2021 and beyond.

By June 30, 2022 the Greater Victoria School District 61 final 2021 Climate Change Accountability Report will be posted to our website at https://www.sd61.bc.ca/news-events/climate-action-initiatives/

Executive Summary

On behalf of the Greater Victoria School District, I am pleased to submit our Carbon Change Accountability Report for 2021.

Once again we found ourselves in the midst of a pandemic year. As the presence of COVID on Vancouver island increased, so did our measures to prevent transmission. Mechanical ventilation, as well as open doors and windows increased again from 2020 levels. There was also no period of closure like we saw in the spring of 2020. As a results we experienced:

- 7% increase in emission levels from 2020
- 14% increase overall since the start of the pandemic.

It is important that we recognize that these increases represent successful efforts to reduce COVID transmission rates, and not a lack of effort to reduce emissions.

Our board remains committed to the reduction of greenhouse gases and has not lost perspective regarding the climate emergency in a year that saw unprecedented weather events both globally and locally.

This year was highlighted by the completion of several highly impactful projects that will continue to positively affect emission levels going forward. The immediate impact of these projects is overshadowed by the results of COVID ventilation, but should become more visible as we return to normal.

2021 Projects are highlighted by:

- Partial retrofit of Spectrum Community Secondary School with high efficiency condensing boilers which have contributed to a 25% reduction in natural gas consumption across the entire school.
- 24kW photovoltaic installation at Torquay Elementary which has generated over 20 MWh of clean electricity in its first year of operation.
- Introduction of Boiler Loop Additive at Lakehill Elementary School, Rogers Elementary School, and Monterey Middle School. Results in other studies have shown an average of 8.4% reduction in natural gas consumption and resulting emissions.
- Purchase of 2 high efficiency condensing boilers for Victoria High School
- Complete LED lighting and controls upgrades of 11 schools in 2021 alone

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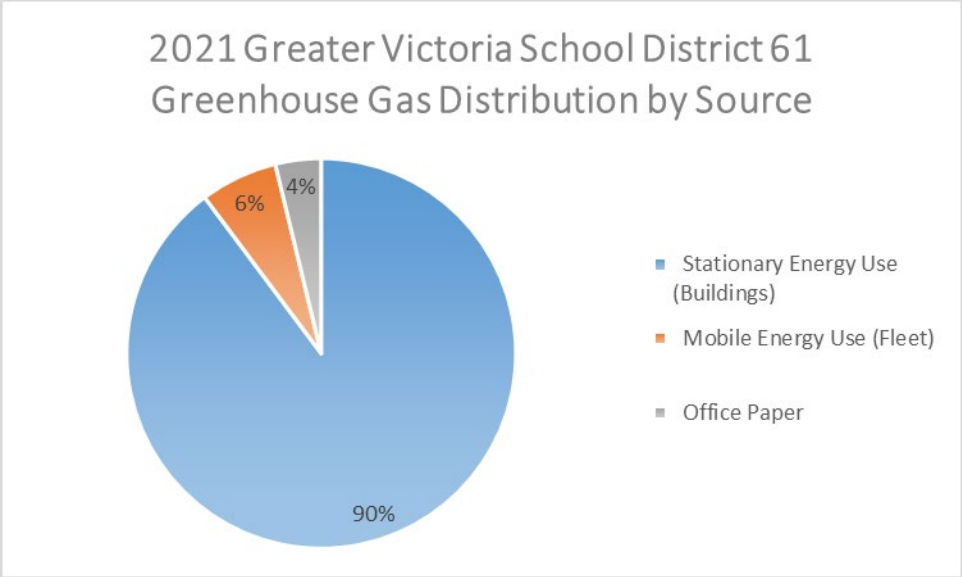
Greenhouse Gas Emissions

Distribution:



The primary source for greenhouse gas emissions within the district has always been from buildings, and continues to be. Within our buildings, heating during the winter season accounts for the vast majority of our total emissions and consequently presents the largest opportunity for conservation as well.

Heating system upgrades, and improvement of building envelopes remain at the forefront of our efforts to reduce overall emissions. High initial investment costs are the largest obstacle we face in this area.

While difficult to measure, programs that create behavioral change, awareness, and accountability will also be important as we continue to work towards achieving our goals. Unlike other mechanical improvements to buildings, these approaches can exists with very little capital investment. This is why we are always working to develop policies and programs that will foster participation from all staff and students. In 2021 our participation in the Energy Wise Network resulted in an effective campaign to replace personal space heaters with seat warmers. This campaign proudly achieved 3rd place provincially at the Energy Wise Summit. We will once again be participating in 2022.

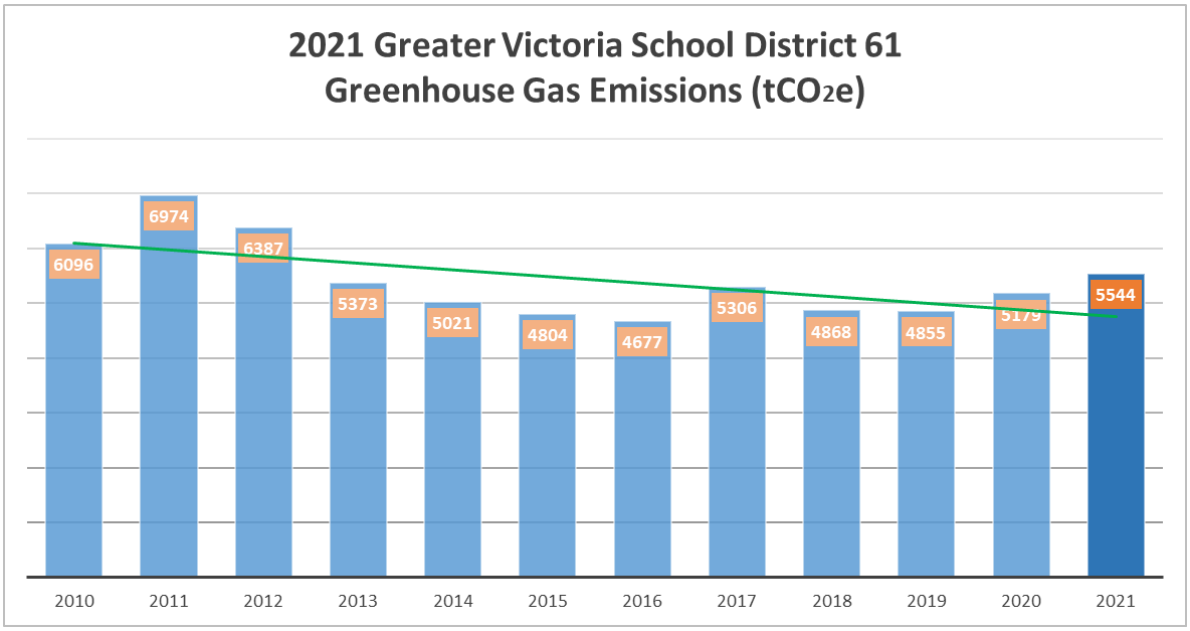
Mobile energy use and paper consumption account for just 10% of our emissions profile, but will not be ignored. 2021 saw continued development towards electrification of our fleet and EV charging infrastructure and more projects are underway for 2022.

Our goals:

At the Greater Victoria School district our goals for reduction of GHG emissions align with the goals of the province:

- 30% by 2025
- 40% by 2030 (fleet)
- 50% by 2030 (buildings)
- 60% by 2040

Current Progress:



The above chart shows combined greenhouse gas emissions generated by our district for each year since 2010.

The trend-line (green) indicates the average trend across 2010 to 2021. The decreasing trend is the product of our efforts and investments since 2010. It represents green choices and an overall effort from everyone at the district.

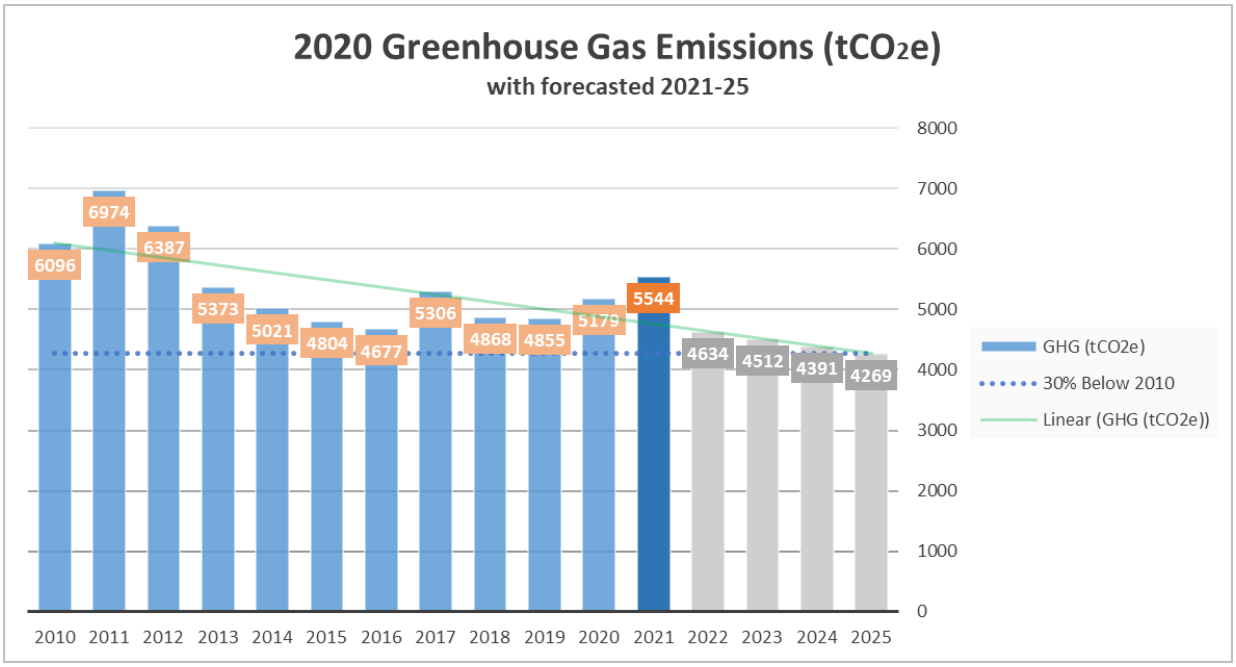
The uptick in 2017 reflects a year with a relatively high amount of heating degree days, as well as the beginning of adopting smaller class sizes. This uptick is common throughout the province. The uptick in 2020 and 2021 is a reflection of increased ventilation during the heating season, in order to ensure a safer workplace during COVID.

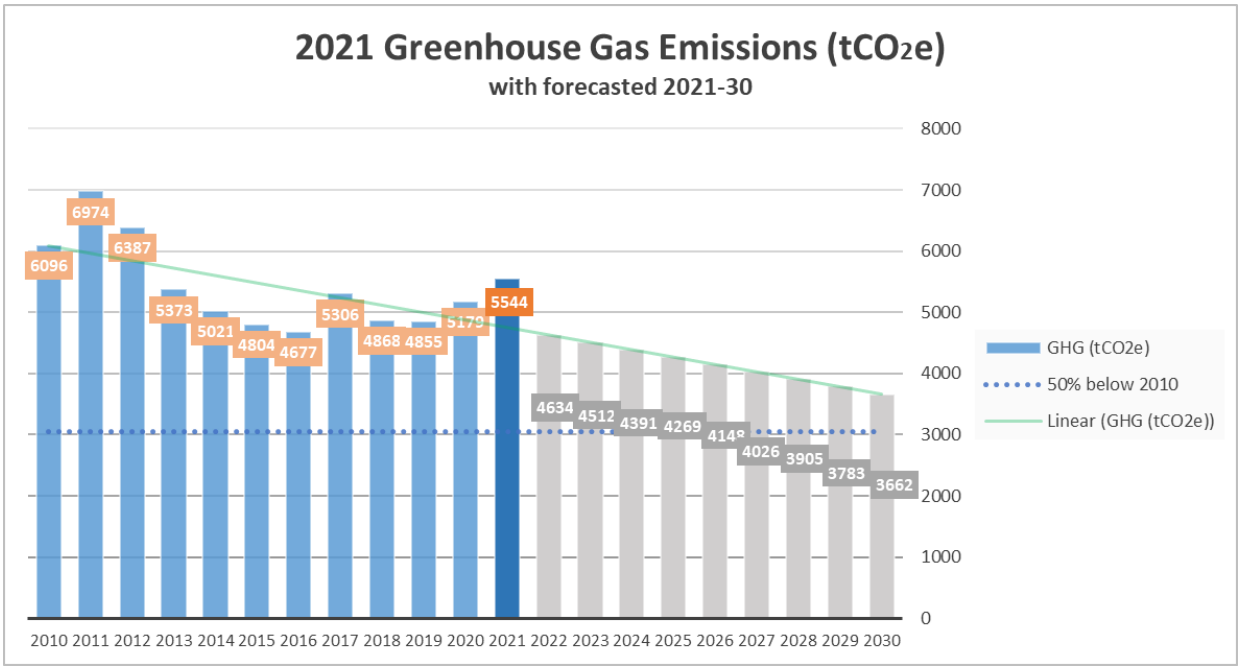
Achieving our goals:

Looking ahead to 2025, we are excited to see that we remain on pace to meet our first goal of 30% GHG emission reduction in spite of the large increase in emissions due to COVID action.

While this chart is validation for our investments so far, it must not be mistaken for victory. We cannot simply coast across the finish line at this point.

COVID action (albeit temporary) has taken us off the average pace to meet the 2030 projections. Our investments and efforts must now increase to keep up. We will need to embrace new technologies, and move forward with new funding for additional GHG reducing projects. We must continue to hold ourselves accountable for waste and educate each other on best practices in our everyday activities.





Actions Taken in 2021 to Reduce Emissions

Spectrum Community Secondary School Boiler Upgrade:

This project began in the summer of 2021 and was completed just in time for heating season. It involved the replacement of obsolete and failing natural gas boilers with new and efficient condensing boilers. Heating system controls were also updated in order to integrate the new components.

Results are showing a 25% overall decrease in natural gas consumption across the entire school since the retrofit.

Torquay Elementary Photo Voltaic Install:

A large 24kW photovoltaic installation was completed at Torquay Elementary School. This install went online in May 2021 and will have generated over 20 MWh of clean electricity by the end of its first year of operation.

Energy Efficient Boiler Additives:

Rogers Elementary, Lakehill Elementary and Monterey Middle School were targeted for a new pilot study that will attempt to achieve the same results experienced at other educational facilities.

This pilot study involves the introduction of an additive that facilitates better conduction of heat within the boiler system. Condensing boilers were targeted due to innate advantages to lower operating temperatures. This should result in higher efficiencies overall. Typical results in other studies have shown an average of 8.4% increase in efficiency. We are very excited to see similar results in our own buildings, however we will need to wait until normal ventilation protocols return in order to compare with baseline years.

LED Lighting and Controls Upgrade:

Complete LED lighting and controls upgrades took place across 11 schools in 2021. These upgrades will conserve well over 600 MWh per year. BC Hydro electricity is a considerably clean source of energy, however, this decrease in electrical building load and increase in electrical capacity could be considered the first step towards further electrification of heating. Electrification of heating will need to play a significant role in GHG reduction as we move beyond our 30% reduction targets.

Plans to Continue Reducing Emissions

Buildings

Heating and Ventilation:

With the vast majority of the district carbon footprint associated with maintaining building temperature and air quality, this will always be a prime focus. Unfortunately major upgrades are expensive and in most cases will only justify their costs when replacing equipment that is at or near end of life. The District is currently preparing for the installation of 2 new high efficiency condensing boilers at Victoria High as well as a second phase of DDC upgrades at Spectrum Community Secondary School. There are also plans for five new projects within the 23/24 capital plan

Building Envelope:

Window and roofing upgrades/repairs are ongoing throughout the district. Mount Douglas Secondary School's upgrade to energy efficient windows is currently underway and now into phase 4.

Boiler Additives:

Pending a review of our existing pilot program, we will look to expand on the use of boiler additives to achieve better efficiency in our heating systems.

Re-commissioning and retro-commissioning of building systems:

Excellent incentive programs exist to investigate and correct issues that prevent buildings from operating the way they were intended. Other findings may bring to light opportunities to incorporate changes in original design that will further enhance performance of older buildings.

The school district is poised to take advantage of opportunities in the very near future and on a continuous basis.

Photovoltaic Generation:

The business case for large scale photovoltaic systems on the rooftop of schools is beginning to make economic and environmental sense. As new technologies emerge and demand for clean electricity increases we will begin to take on more projects like the 2021 Torquay Elementary photovoltaic install.

LED Retrofits:

The district has been moving forwards with LED technology since May 2019, and plans to completely retrofit all buildings by the end of 2024. Electricity saved will help decrease infrastructure requirements towards electrification of buildings

Renewable Natural Gas:

Perhaps one of the most misunderstood and greatest potential contributors to decreasing net emissions is through the purchase of renewable natural gas. Methane that has been captured before it is released into the atmosphere can be burned for energy. The resulting emissions will have only a fraction of global warming potential of the methane that was captured.

Renewable natural gas is captured from waste, and livestock (not fossil fuels). Much like 100% recycled paper, it is a more expensive up front, but when considering the high cost of electrification of heat, and the expense of maintenance, the business case here is strong.

Limited supply makes this only part of an overall solution.

Net-Zero Ready Building:

Planning for the new Cedar Hill Middle School is now underway. We are focusing on energy efficiency, conservation, and low carbon mechanical systems in order to produce our first net zero ready building. The new building will have the potential to eventually achieve net zero energy with the future expansion of its 100kW rooftop photo voltaic system. To further this initiative the Board of Education is committing $500K from its reserves to self-fund part of this initiative, and is outside the Ministry funding for a new build

Fleet

Electric Vehicles and Charging Infrastructure:

Projects have already begun in 2022 for the addition of:

- 7 new electric charging stations for fleet vehicles and buses
- 4 new electric buses

In addition plans are in place to begin the electrification of fleet through the purchase of electric vehicles in 2022/23 and as they become readily available.

Supplies:

District policy already calls for the use of 100% recycled material when possible, however we still missed an opportunity with our paper consumption. In 2021 we created over 40 tCO2e from the times we used less than 100% recycled paper in our buildings.

Moving forward we will look to raise awareness of this policy, and help our buildings to make the best choice when ordering supplies. New products that use alternative recycled fibers are being piloted.

Behavior Change:

Programs that create behavioral change, awareness, and accountability transcend all of the above categories. These approaches can exists with very little capital investment. This is why we are always working to develop policies and programs that will foster participation from all staff and students. In 2022 we will again be participating in the Energy Wise Network with a incentivized program to decrease summer electricity usage. We will also be expanding on the our popular “Space Heater Defeater” campaign from 2021.

The board has requested and approved the formation of a Climate Action Committee in order the help promote a positive culture shift towards eco-friendly habits across the district and to help plan for the future.

Behavioral change will be critical towards eliminating the gap between 2030 goals and current projections.

Climate Risk Management

2021 gave us some strong examples of what unprecedented climate change events can look like. More work needs to be done to fully understand the risks that these types of events represent to our buildings and occupants.

As a direct result of the record setting events of the 2021 summer “heat dome”, the district has moved to incorporate heat pumps into both existing and new construction child care portables.

These heat pumps will help provide a safe space for occupants during summer while decreasing winter energy demands and costs. They will also serve as a model for future projects.

Emissions and Offsets Summary Table

***Greater Victoria School District 61* 2021 GHG Emissions and Offsets**	
GHG Emissions created in Calendar Year 2020	
Total Emissions (tCO_2e)	*5558*
Total BioCO_2	*13.9*
Total Offsets (tCO_2e)	*5544*
Adjustments to Offset Required GHG Emissions Reported in Prior Years	
Total Offsets Adjustment (tCO_2e)	*0*
Grand Total Offsets for the 2020 Reporting Year	
Grand Total Offsets (tCO_2e) to be Retired for 2020 Reporting Year	*5544*

Offset Investment ($25 per tCO_2e) *[Grand Total Offsets to be Retired x $25/$tCO_2e$]*	*$138,600*

History of Greenhouse Gases and Offsets

Year	Totals	Emissions	Offsets Purchased
2010	6082	6096	$152,050
2011	6950	6974	$173,750
2012	6362 + 22	6387	$159,050
2013	5545 - 172	5373	$134,325
2014	5041-20	5021	$125,525
2015	4823-19	4804	$120,100
2016	4449+228	4677	$116,925
2017	5290+16	5306	$132,250
2018	4849 + 19	4868	$120,566
2019	4856	4856	$120,566*
2020	5178 + 6	5184	$129,600
2021	5544	5558	$138,600

* Offsets purchased for 2019 were based on 2018 to allow for COVID disruptions.

Retirement of Offsets:

In accordance with the requirements of the *Climate Change Accountability Act* and Carbon Neutral Government Regulation, *The Greater Victoria School District 61* **(the Organization)** is responsible for arranging for the retirement of the offsets obligation reported above for the 2020 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.

Executive sign-off:

Executive Sign-off:

Signature	Date
Name (please print)	Title

[Please email your signed, completed report to Carbon.Neutral@gov.bc.ca by no later than May 31, 2022.]