

*2020 PSO CLIMATE CHANGE ACCOUNTABILITY
REPORT(CCAR)*

SCHOOL DISTRICT NO. 71
COMOX VALLEY SCHOOLS



Comox Valley Schools

A Community of Learners

INNOVATIVE • INQUISITIVE • INCLUSIVE

VANCOUVER ISLAND

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DECLARATION STATEMENT

This Climate Change Accountability Report (CCAR) for the period January 1st, 2020, to December 31st, 2020, summarizes our emissions profile, the total offsets to reach net-zero emissions, the actions we have taken in 2020 to reduce our greenhouse gas emissions, and our plans to continue reducing emissions in 2021 and beyond.



By June 30, 2021, School District No. 71 (SD71), also referenced as Comox Valley Schools, will post this Climate Change Accountability Report to our website at www.comoxvalleyschools.ca/.

SD71 ENVIRONMENTAL STEWARDSHIP

As part of its *Value Statement*, The Board of Education of SD71, Comox Valley Schools, embraces and encourages **Global Awareness and Environmental Stewardship**. Furthermore, **Organizational Stability & Environmental Stewardship** is one of four strategic priorities of the district's *Strategic Plan* with the goal of cultivating environmental stewardship by fostering the following actions:

- Align outdoor and environment learning opportunities for long-term sustainability
- Reduce carbon emission and environmental footprint
- Support the establishment and augmentation of school garden projects
- Reduce the use of single-use plastics throughout the district
- Implement strategies for zero waste by increasing recycling and composting efforts in all facilities
- Augment the Active Travel Program and public transit commute initiatives

OVERVIEW - COMOX VALLEY SCHOOLS

School District No. 71 is one of 60 school districts in British Columbia. In addition to serving the central Vancouver Island municipalities of the City of Courtenay, the Town of Comox and the Village of Cumberland, SD71 also serves students in the surrounding communities of Black Creek, Merville, Royston, Union Bay, Hornby Island and Denman Island.

QUICK FACTS – SD71 serves:

- 1 Regional District
- 2 Islands
- 9500 + students
- 3 Municipalities
- 1 First Nation



Vancouver Island, BC

Fifteen Elementary Schools: Airport, Arden, Aspen Park, Brooklyn, Courtenay, Cumberland Community School (K-9), Denman Island, École Puntledge Park, École Robb Road, Hornby Island, Huband Park, Miracle Beach, Queneesh, Royston, Valley View

One Middle School: Lake Trail Community School (Gr. 6-9)

Three Secondary Schools: Georges P. Vanier, Highland, Mark R. Isfeld

Additional Schools/Programs: Glacier View Secondary Centre (Alternate Gr. 8-12), Nala'atsi Alternate Program, Navigate (NIDES), International Student Program

SD71's Vision and Mission Statement:

"An inclusive learning community that embraces diversity, fosters relationships and empowers all learners to have a positive impact on the world. To inspire engaged, compassionate, resilient lifelong learners and cultivate a collaborative community together."

Board of Education 2019 – 2023

OVERVIEW - GHG REPORTING

In 2007, the BC Government took a major step in the fight against climate change by setting aggressive greenhouse gas (GHG) reduction targets and making it legally binding. The Climate Change Accountability Act (CCAA), formerly titled “Greenhouse Gas Reduction Targets Act (GGRTA)” updates legislated targets for reducing greenhouse gases. Under the Act, BC's GHG emissions are to be reduced by the following listed targets set for the Public Sector Organizations (PSOs) and regulated by the Carbon Neutral Government:

- ❑ By 2030, BC will reduce GHG emissions by 40 per cent, compared to 2007 levels
- ❑ By 2040, BC will reduce GHG emissions by 60 per cent, compared to 2007 levels
- ❑ By 2050, GHG emissions will be reduced by at least 80 per cent below 2007 levels

To meet legislated targets, all PSOs including school districts, are required to be carbon neutral. The phrase “carbon neutral” is a way to explain and take responsibility for the GHGs emitted. As a PSO “adding” GHGs to heat buildings, the emissions can be “subtracted” by purchasing carbon offsets. These purchased offsets support innovative BC-based projects that create economic opportunities and fosters the use and development of clean technologies across the province. All public sector organizations follow a five-step process to become carbon neutral and have been doing so since 2010.

SD71 has implemented these five steps to become carbon neutral. Firstly, **measuring** operational GHG emissions from district buildings, district vehicles and district wide paper consumption. Secondly, **reducing** emissions where possible through an integrated approach. Thirdly, **offsetting** SD71 GHG emissions by purchasing an equivalent amount of high quality, made-in-BC carbon offsets. Fourthly, **reporting** annually on progress through the Climate Change Accountability Report (CCAR) and finally, **verifying** data and emissions through the BC government online application Clean Government Reporting Tool (CGRT) to convert GHG emissions into a unit of measure. All PSOs enter their data into CGRT which then converts this data into **tonnes of carbon dioxide equivalent (tCO₂e)**.

EMISSIONS & OFFSETS SUMMARY



To become carbon neutral for the 2020 calendar year, SD71 purchased carbon offsets for 1974 tonnes of carbon dioxide equivalent (tCO₂e) emitted.

Due to the COVID-19 pandemic, the Climate Action Secretariat (CAS) directed all PSOs to use their total reported 2018 GHG emissions as a temporary estimate for 2019. Subsequently, 2020 GHG emissions include an adjustment for the difference not reported in 2019. The adjustment for SD71 is a difference of 46 tCO₂e. In 2018 SD71 reported a total of 1956 tCO₂e. 2019 accounted for a total of 2002 tCO₂e; a difference of 46 tCO₂e from the 2018 placeholder.

The final emissions calculated for 2020 came in at 1928 tCO₂e; the adjustment of 46 tCO₂e has been carried into SD71's 2020 total tonnes of carbon dioxide equivalents and carbon neutrality for 2020 has been achieved by purchasing carbon offsets for 1974 tCO₂e.

Emissions and Offset Summary Table:

School District 71 2020 GHG Emissions and Offsets	
GHG Emissions created in Calendar Year 2020	
Total Emissions (tCO ₂ e)	1934
Total BioCO ₂ <small>(note: BioCO₂ is separated from total emissions)</small>	5.94
Total Offsets (tCO ₂ e)	1928
Adjustments to Offset Required GHG Emissions Reported in Prior Years	
Total Offsets Adjustment (tCO ₂ e)	46
Grand Total Offsets for the 2020 Reporting Year	
Grand Total Offsets (tCO ₂ e) to be Retired for 2020 Reporting Year	1928 + 46
Offset Investment (\$25 per tCO ₂ e) [Grand Total Offsets to be Retired x \$25/tCO₂e]	(1974) X \$25

Retirement of Offsets:

In accordance with the requirements of the Climate Change Accountability Act and Carbon Neutral Government Regulation, School District No. 71 (**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:

Signature: 

Name: Mr. Tom Demeo

Date: May 25th, 2021

Title: Superintendent of Schools

Clean Government Reporting Tool (CGRT) GHG Offset Summary



COffset Required GHG Emissions by Activity Data Source (no Biogenic)

	Offset Required
	2020
Direct Fuel Combustion	
t CO ₂ e, GHG, All	1633
Purchased Energy	
t CO ₂ e, GHG, All	62.0
Mobile Energy Use	
t CO ₂ e, GHG, All	187
Office Paper	
t CO ₂ e, GHG, All	45.7
Fugitive Emissions	
t CO ₂ e, GHG, All	

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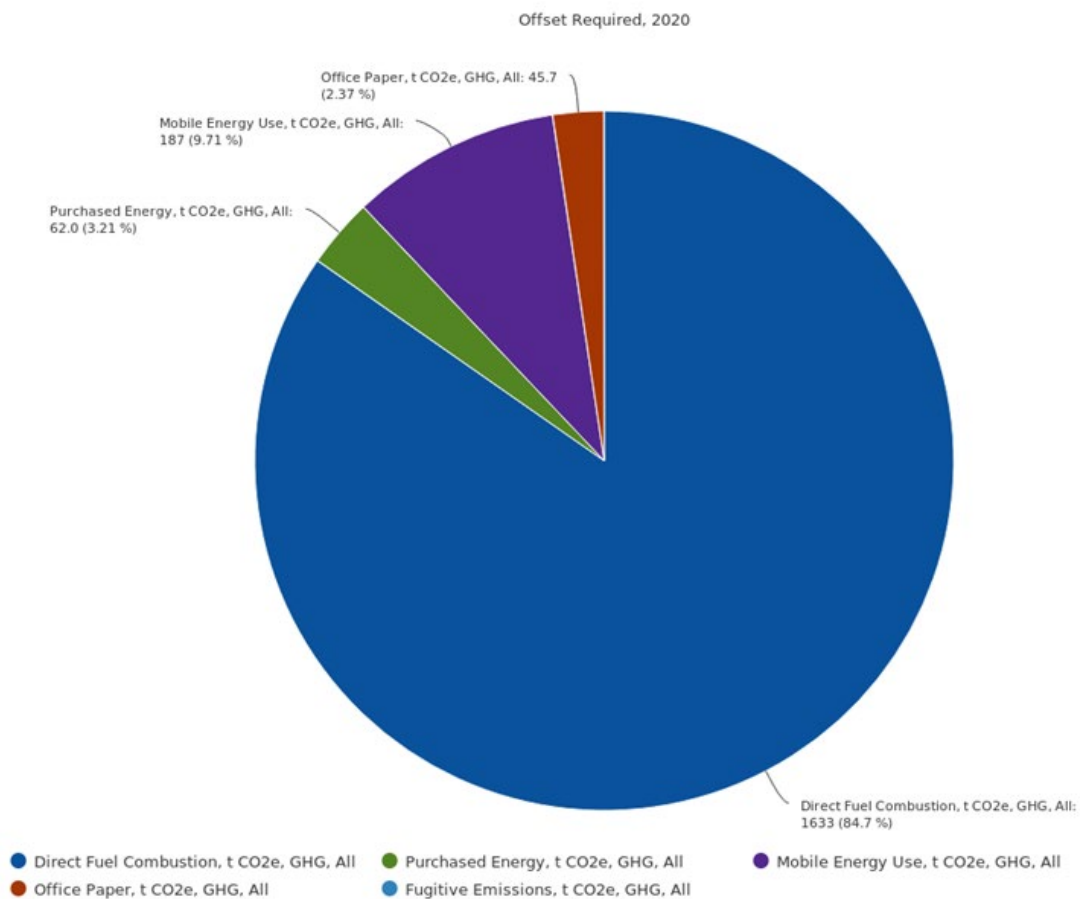


Figure 1 – CGRT graph showing proportional GHG emissions in tCO₂e by SD71 in 2020

OVERVIEW - ACTIONS TAKEN IN 2020

Throughout SD71 we are committed to preparing all learners for a changing world. We value educational excellence, community engagement, organizational stability, environmental stewardship, physical health, and mental well-being. SD71 has met the challenges of rising heating costs and increased demand on aging facilities. Senior management plays an active role in seeking out and securing funding opportunities that will result in GHG emission reductions. SD71 is committed to minimizing GHG emissions and energy efficiency highly contributes to this goal. The following four principles are of key importance when assessing the need for replacing equipment:

1. Creating healthy environments, including air, temperature and noise for students, teachers and support staff
2. Reducing GHGs
3. Reducing energy consumption and waste
4. Increasing equipment and system efficiency

The most significant GHG reduction upgrade projects completed in 2020 include:

1. Queneesh Elementary Boiler Plant Upgrade
2. Huband DDC Controls Upgrade
3. Mark R. Isfeld Secondary HVAC (mechanical) Phase 2 Upgrade

1. Queneesh Elementary School Boiler Plant Upgrade Project

As the boilers at Queneesh Elementary School were at the end of their service life, the old, inefficient, gas fired atmospheric copper fin hot water space heating, Lochinvar boilers were removed and replaced with six high efficiency Viessmann condensing boilers and pumps. The work was completed in June 2020.



Figure 2 – Queneesh Elementary School Boiler and Pump Replacements

This project was subsidised by the provincial Carbon Neutral Capital Program (CNCP). Annual estimated gas consumption is expected to be reduced by 33.3%. Annual expected emission reductions from this project are approximately 35.32 tonnes of carbon dioxide.

2. Huband Direct Digital Control (DDC) Systems Upgrade

DDC systems can simplify processes and allow for system automation and energy efficiency in the workplace. They are a key component to optimizing efficiency of HVAC and energy management systems and applications. Upgrades to the Huband DDC systems aid in reducing energy waste, reducing energy consumption and increasing system and equipment efficiency. The old system at Huband had reached its 'end of life cycle' and was obsolete. The upgrade at Huband is estimated to reduce the schools annual carbon footprint by 10.5 tonnes of carbon dioxide. This project was partially funded by the provincial CNCP.



Figure 3 - Huband DDC Systems Upgrade – Building Controls and Control Valves

3. Mark R. Isfeld Secondary HVAC (mechanical) Phase 2 Upgrades

Completed in August 2020, this phase of the project resulted in changing the return air path from general circulation in an open ceiling space to a ducted route through the ceiling space and modification of the return air ductwork at each air handling unit to draw from. The update creates a cleaner school environment and improves air flow efficiency and energy savings and reduced emissions. Updating to a ducted system increases efficiency by reducing the air volume to be controlled by energy, thereby reducing energy used in the HVAC system. Ducts also aid in keeping the air cleaner. Dirtier air requires more energy so by having ducts and keeping the air cleaner we gain efficiencies and reduce energy loss. This project was funded through the Ministry of Education Capital Plan, School Enhancement Program (SEP) funds.



Figure 4 – Mark R. Isfeld Secondary HVAC (mechanical) Phase 2 Upgrades: Ducted Air Return Installed

4. Various Building and Equipment Upgrades

- A. **IT Hardware Upgrades** - The IT Department continues to replace older computers that draw more power and create more heat with newer units as a part of the district's ongoing technology replacement plan. At the same time, replacing older liquid-crystal display (LCD) monitors with newer light-emitting diode (LED) monitors results in less heat generation and power loss. Additionally, centrally located printers have replaced multiple personal use printers.



- B. Ongoing light-emitting diode (**LED**) **Light upgrades** were completed in various school classrooms and office spaces. The new LED lighting consumes **40% less electricity**, has lower maintenance and a much longer life span than the former fluorescent tube lighting, which contains mercury and uses heat to create light.



- C. **SD71 Fleet Upgrades** - SD71 continues to remove older fleet vehicles and purchase newer vehicles that are fuel-efficient and produce **less emissions**.



OVERVIEW - SUCCESS STORIES

Roughly, 80% of SD71 buildings have fuel heating. Natural gas and propane have much higher tCO₂e emissions than electricity. Therefore, as funding and budgets allow, it is imperative to assess and plan which equipment, such as boiler plants, should be upgraded/replaced to reduce GHG emissions and gain better fuel efficiency. The next few pages summarize four school boiler replacements from the years 2018 and 2019.

Valley View Elementary Boiler Replacement – Summer 2018

Completion of the boiler replacement at Valley View Elementary School occurred in September 2018. A 2017 mechanical feasibility study of Valley View Elementary identified that the standard gas fired boilers were inefficient and close to the end of their expected service life.

The Valley View Elementary School boiler replacement was partially funded by the provincial CNCP. This program provides grants to PSOs to invest in capital projects that reduce energy costs and lower carbon emissions. Funding is allocated by the Ministry of Health to six health authorities including the Ministry of Education to school districts.

Cumberland Community (Beaufort Building) School, Mark R. Isfeld and Highland Secondary Boiler Replacements – Summer 2019

Completion of all three school boiler replacements took place in July 2019. Highland was funded through CNCP and SD71 local capital funding. Cumberland Community (Beaufort Building) and Mark R. Isfeld Secondary were funded by SD71 local capital funding and through SEP funding, which is part of the Ministry of Education's Minor Capital Funding Programs.

Boiler plants at each school were at the end of their expected service life as identified in mechanical feasibility studies for each location. New boilers have better **annual fuel utilization efficiency (AFUE) ratings** – generally speaking, a higher AFUE rating means higher efficiency. New boilers have an AFUE of 90 to 95% vs older boilers with an AFUE of 55 to 65%. Replacing all the old standard efficiency boilers with high efficiency boilers increases student

and staff comfort and reduces natural gas consumption. All boiler replacements were upgrades from non-condensing boilers to condensing boilers. The image below notes some of the key differences:

Differences between Condensing & Non-Condensing Boilers	
Condensing Boilers	Non-Condensing Boilers
One or more larger heat exchangers	Single combustion chamber and single heat exchanger
Lower temperature of combustion products (around 55°C)	Higher temperature of combustion products (around 180°C)
Exhaust gas is recycled through the condensing heat exchanger	Combustion gases go into the flue and 30% of the heat is wasted
Help combat climate change by reducing CO ₂ emissions	Higher carbon footprint
Higher initial cost, but cost efficient in the long-run	Lower initial cost, but very costly venting

The chart below highlights natural gas consumption in tonnes of carbon dioxide equivalents (tCO₂e) for Valley View Elementary, Cumberland Community (Beaufort Building), Mark R. Isfeld and Highland Secondary for the years 2016-2020.

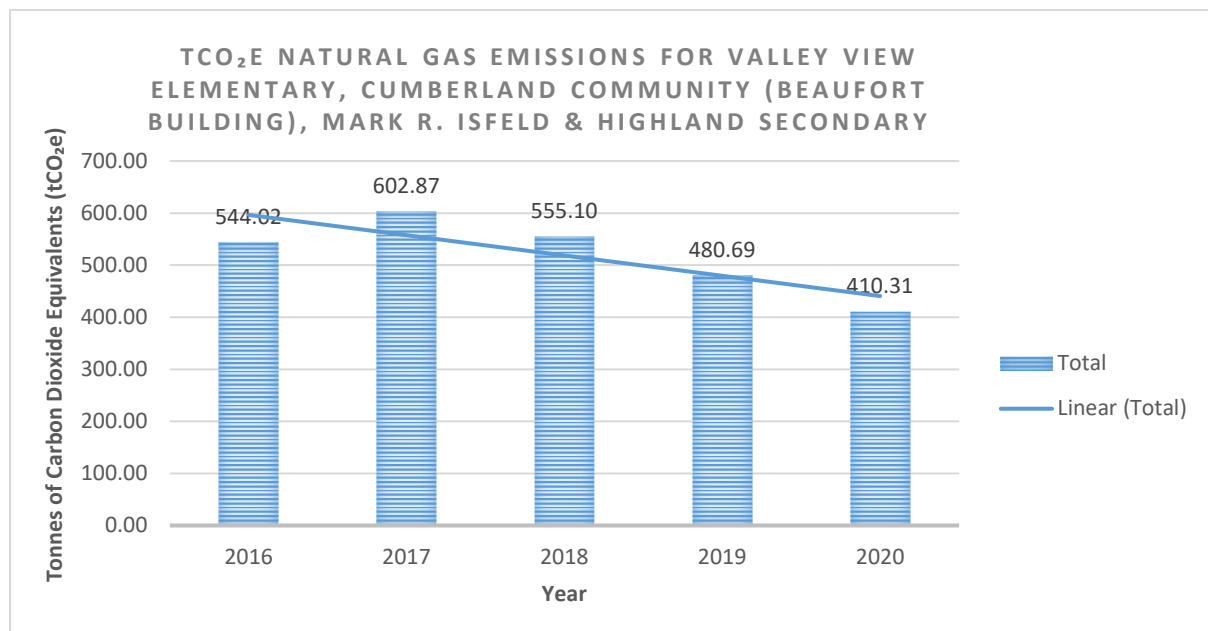


Figure 5 - tCO₂e in Natural Gas emissions from Valley View Elementary, Cumberland Community (Beaufort Building), Mark R. Isfeld and Highland Secondary annually from 2016-2020

An aggregate downward trend showing reduced carbon emissions from natural gas by

approximately 32% from 2018 levels is identified in the graph. This lines up with estimates from mechanical feasibility reports identifying approximately 30% emission reductions by replacing the old boilers with newer higher efficiency condensing boilers.

OVERVIEW - FUTURE EMISSIONS REDUCTION

Comox Valley Schools aims to contribute to the 2050 emission reductions targets as set out by the BC government by reducing the GHG emissions in 2020 and beyond.

The largest portion of the School District's GHG emissions originate from the energy used to heat and power the schools, maintenance and administration buildings. Consequently, the largest GHG reduction initiatives and applications for funding are directed towards reducing the energy consumption from buildings. Some key strategies include assessing the energy performance of each school site and identifying future energy efficiency projects that will reduce consumption in the district facilities. These assessments will factor in the *Annual Facility Grant (AFG)* project planning process, the *Annual Capital Plan*, the *Long Range Facilities Plan (LRFP)*, and the *Carbon Neutral Capital Program (CNCP)* funding requests.

Planned Energy Efficiency Projects for 2021:

- ❑ Installation of **high efficiency boiler plant and Direct Digital Controls (DDC)** at Lake Trail Middle School with funding from the provincial Seismic Upgrade Program.
- ❑ Installation of a **high efficiency boiler plant** at Brooklyn Elementary School with provincial CNCP and AFG funding.
- ❑ Replacement of Aspen and Huband Elementary boilers **with high efficiency boiler plants** with funding from the provincial AFG.
- ❑ **DDC upgrades** will be completed at Aspen, Brooklyn and Queneesh Elementary Schools with *SD71 local capital funding*.
- ❑ Installation of **high efficiency in-floor radiant heating and DDC** at Hornby



Island Elementary School with provincial capital funding.

Additionally, SD71 senior management continues to assist teachers, support workers, parents, and students in their educational green initiatives and activities throughout the school district and community. Of note, Arden Elementary started a compost program at its school in 2020 and is continuing the program, engaging students and staff in the process.



Every class has their own compost bin that they fill up during the week.

One class is responsible for collecting and dumping all the classroom bins into a larger bin that gets collected every Friday. The composting program is part of the school's initiative to have less waste at school and is championed by a few staff members.

Furthermore, the SD71 operations team is starting to consider avenues for assessing, managing, and reporting climate-related risks and ways to adapt operations for climate resiliency.

