



Strategic Energy Management Plan 2022

School District 72 (Campbell River)



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1.0 Our Organization

School District 72 is one of 60 school districts in British Columbia. Based in Campbell River and includes 18 schools. Although most schools are located within the City of Campbell River, School District 72 has outlying schools in the Village of Sayward, Read Island and Cortes Island.

This report provides an overview of our school district's energy consumption and expenditures and our organization's carbon footprint.

1.1 Facility Profile

Energy Intensity expresses a building's energy use as a function of its size or other characteristics. This measurement facilitates comparison of different sized buildings. In 2021, our overall energy intensity increased by 7% compared to 2020 but remained below 2019 levels. This reflects the 2021 4% increase in Heating Degree Days and 249% increase in Cooling Degree Days compared to 2020. A notable exception to the overall 2021 increase in energy intensity was the School Board Office. This is attributed to the relocation of the IT department to Robron Centre.

The following table summarizes the energy consumption, cost and energy intensity for all School District 72 facilities. To accommodate varying billing periods, the information is normalized by calendar year.

Facility Profile

Site	Size m ²	2021 Annual Energy Consumption GJ (e)	2021 Annual Energy Cost (\$)	2021 Energy Intensity GJ (e) per m ²	2020 Energy Intensity GJ (e) per m ²	2019 Energy Intensity GJ (e) per m ²
Carihi	10,533	7,985	134,042	0.76	0.70	0.76
Cortes	1,382	1,074	46,194	0.78	0.68	0.69
Cedar	2,389	1,781	31,654	0.75	0.73	0.82
Discovery Passage	1,602	983	16,431	0.61	0.61	0.58
EDM	2,409	1,472	26,294	0.61	0.59	0.66
Georgia Park	3,375	2,178	44,022	0.65	0.65	0.71
Maintenance/Bus Garage (incl 3 portables)	2,068	909	23,281	0.44	0.44	0.45
Ocean Grove (incl 3 portables)	2,769	1,680	35,760	0.61	0.62	0.67
Oyster River	2,106	1,633	31,069	0.78	0.65	0.65
Penfield	2,918	1,663	51,291	0.57	0.47	0.43
Phoenix (incl 1 portable)	8,370	4,456	71,678	0.53	0.52	0.69
Pinecrest	3,221	2,198	33,362	0.68	0.62	0.61
Quadra	2,647	1,010	35,360	0.38	0.39	0.41
Ripple Rock (incl 2 portables)	2,890	2,251	40,722	0.78	0.73	0.75
Robron	6,906	4,359	82,509	0.63	0.56	0.64
Sandowne	3,581	1,996	43,942	0.56	0.55	0.64
Sayward	2,977	1,581	80,431	0.53	0.54	0.51
School Board Office (incl 1 portable)	1,824	1,627	50,293	0.89	0.94	0.87
Southgate	7,373	4,436	85,796	0.60	0.52	0.50
Surge Narrows (incl Community Use)	530	344	14,652	0.65	0.30	0.68
Timberline (incl 1 portable)	9,261	6,476	117,273	0.70	0.61	0.74
Willow Point	2,772	1,924	32,544	0.69	0.61	0.74
TOTAL	83,902	54,016	1,128,600	0.64	0.60	0.66

2.0 Our Commitment

2.1 Why is energy conservation important to us?

Energy conservation is considered an integral component of sustainable environmental practices and education curriculum.

Financial benefits of energy conservation are both direct (through reduced utility costs) and indirect (reduced carbon offset payments). These savings are made available for educational programs and reinvestment into future energy conservation initiatives.

Strengthening and expanding community relations is important to Campbell River School District Strategic Plan. Environmental stewardship awards from the City of Campbell River, Union of BC Municipalities, and Campbell River Chamber of Commerce reflect our positive relationships with community partners. Additionally, strategic partnerships have been established with BC Hydro (Energy Manager program), Fortis BC (rebate programs), Natural Resources Canada (provision of benchmarking data through surveys), and the BC Climate Action Secretariat (Climate Change Accountability Reports). Since 2010, School District 72 has received many awards from BC Hydro for energy conservation projects. In 2021, FortisBC recognized School District 72 with the Efficiency in Action Award in the Medium Commercial category.

2.2 Operational Procedure 515 – Environmental Responsibility

Background

The District is committed to fostering policies, practices and educational programs which will protect and preserve the environment.

Procedures

1. The District will endeavour to purchase “environmentally friendly” products which will provide the highest possible level of performance.
2. The efficient use of energy and water will be guiding principles in all renovations, new construction and operations.
3. The District encourages and supports initiatives to reduce, recycle and recover waste materials in all schools and departments.

4. The District supports staff development initiatives designed to advance environmental awareness, environmental education and care for the environment within annual budget allocations for training and development.

5. Environmental education will continue to be incorporated into the content and methodology of the instructional program.

3.0 Understanding Our Situation

3.1 Utility Consumption and Costs

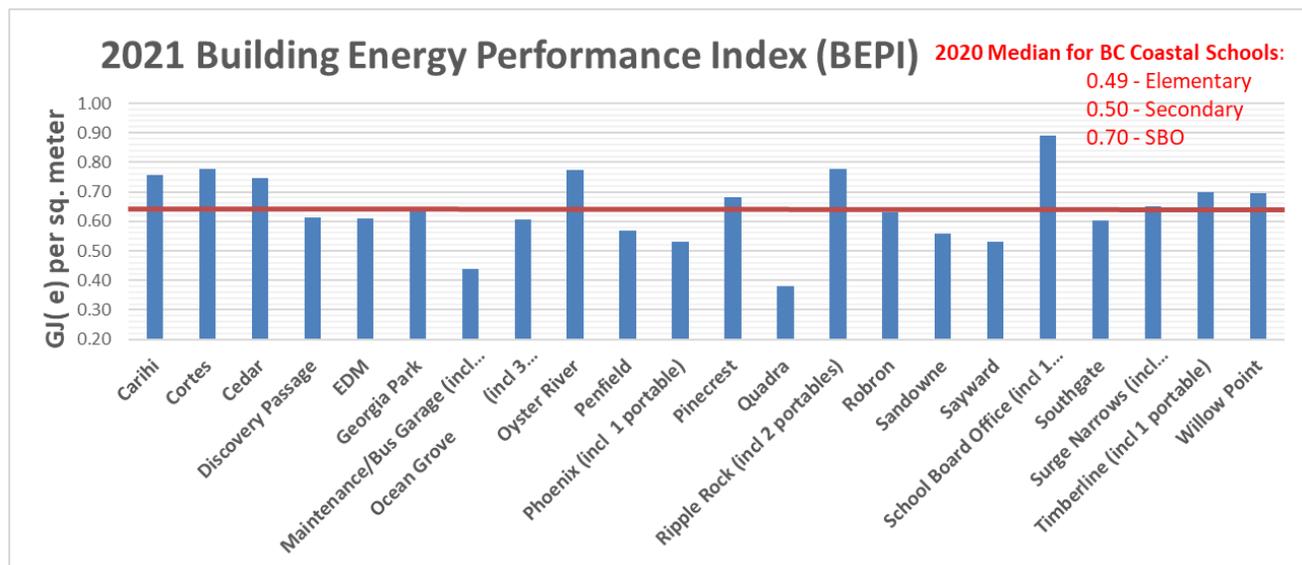
Most school district sites rely on natural gas for space heating. Exceptions are Sayward Elementary and Cortes Island (propane), Penfield Elementary and Quadra Elementary (electricity) and Surge Narrows school (diesel). As a result, the majority of school district energy consumption is from electricity and natural gas use.

Referring to the following table, electricity is the largest component of School District 72 utility costs. This fact contributed to the school district decision to become a member of the BC Hydro Energy Manager program from 2009 to 2015. During this period, lighting upgrades were completed throughout the school district. In recent years, resources have focused more on reducing natural gas use because the majority of the School District 72 carbon footprint is the result of fossil fuel consumption.

2021 Calendar Year	Normalized Consumption	Normalized Costs	
	GJ	\$	%
Electricity	21,540	668,040	51.8%
Natural Gas	30,372	373,501	29.0%
Propane (buildings)	1,842	109,547	8.5%
Diesel (marked)	344	14,652	1.1%
Water, excl irrigation	36,330 m ³	45,593	3.5%
Irrigation	39,431 m ³	28,390	2.2%
Sewage	22,312 m ³	52,738	4.1%
Refuse	235 Tons	49,523	3.8%
Recycling	35 Tons	21,419	1.7%

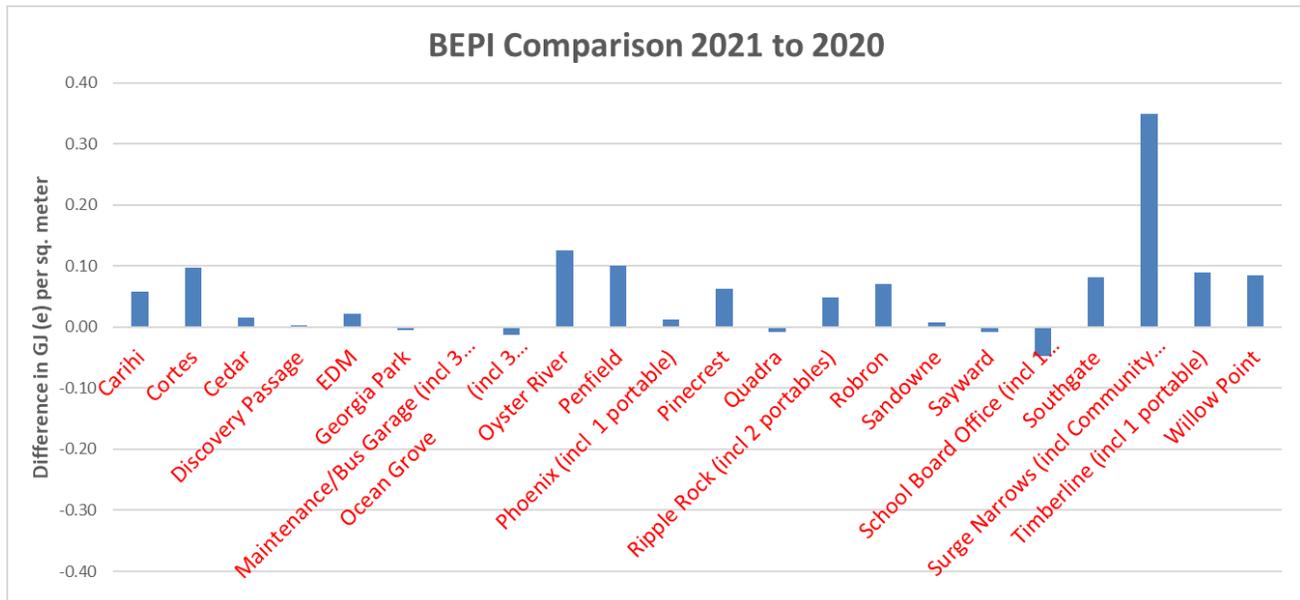
3.2 Savings Opportunity Assessment - Energy Consumption Intensity

The School District 72 Building Energy Performance Index (BEPI) in 2021 increased by 4% compared to 2020. This is attributed to increases in both Heating Degree Days and Cooling Degree Days in 2021 compared to 2020, the extensive use of portable HEPA filtration units due to COVID-19, and the adoption of MERV-13 filters throughout the school district. We continue to have above average energy intensity compared to most BC coastal school districts. This suggests further opportunities are available for energy savings, cost avoidance and a lower carbon footprint.



For 2021, the four buildings in School District No. 72 with the highest BEPI were:

- Ripple Rock Elementary. The open concept of the building and extensive southern exposure makes this building particularly sensitive to changes in heating degree days. Life-cycle replacement of the boilers is planned for 2022, which is expected to decrease energy consumption.
- School Board Office. School board offices typically have high energy intensity relative to other school district facilities. In 2021, however, the IT department relocated to Robron Centre. This contributed to the largest decrease in BEPI compared to 2020.
- Cortes Elementary. The significant increase in the BEPI is attributed to issues with the boiler system and heating controls. A mechanical engineering study is underway to investigate and provide recommendations.
- Oyster River. As a result of supplies and furniture being returned to schools, extensive activity occurred at this storage location. This increased demand on the heating system. The situation is being monitored before investing in energy efficiency upgrades.



School District 72 buildings with the greatest BEPI increase in 2021 were:

- a. Oyster River. The 13% increase in the BEPI reflects increased activity at this storage location, due to supplies and furniture being returned to schools.
- b. Penfield Elementary. Four classroom unit were replaced in the summer of 2021 and roof replacement of the entire building is in progress. These efforts are expected to improve the BEPI in 2022.
- c. Surge Narrows School. As demonstrated by the significant BEPI decrease in 2020, followed by the increase in 2021, the timing of diesel fuel deliveries affects the BEPI. Nevertheless, a planned replacement of the classroom heat recovery units should have a positive impact on the 2022 BEPI.
- d. Cortes Elementary. Recurring boiler and heating control issues were experienced for much of 2021. A mechanical engineering study is underway to investigate and provide recommendations.

The only significant BEPI decrease (5%) in 2021 was the School Board Office. This is attributed to the move of the IT Department to Robron Centre. Conversely, Robron Centre experienced in its BEPI. A project is underway for Robron Centre to upgrade heating controls, which should improve that building's energy performance.

4.0 Our Actions

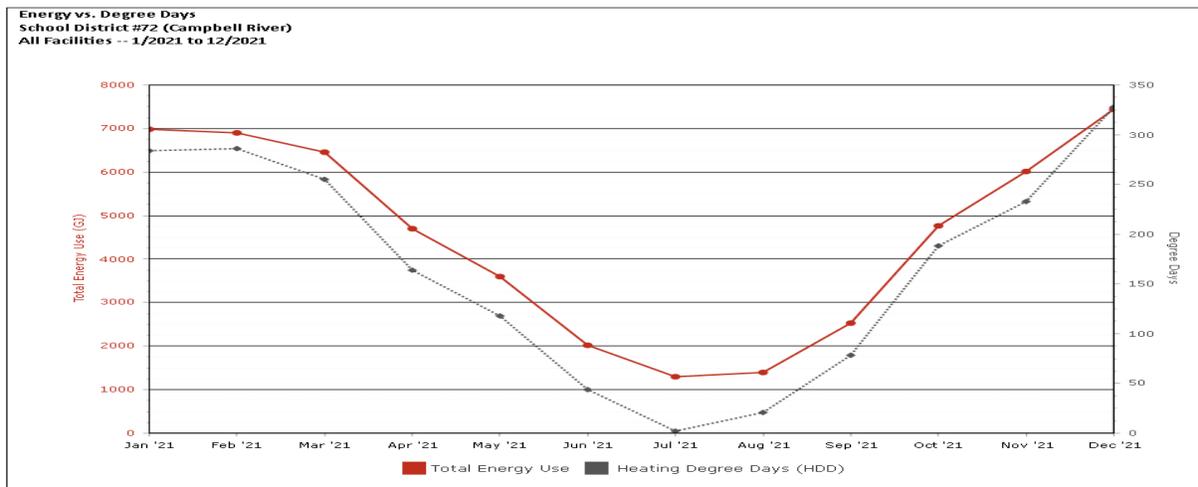
4.1 Program Results 2007-2021

School District 72’s successes in energy conservation are described in previous Strategic Energy Management Plans and the feature article in the Ministry of Environment report Carbon Neutral Government: Year in Review 2015.

Energy Intensity by Heating Degree Days (HDD)

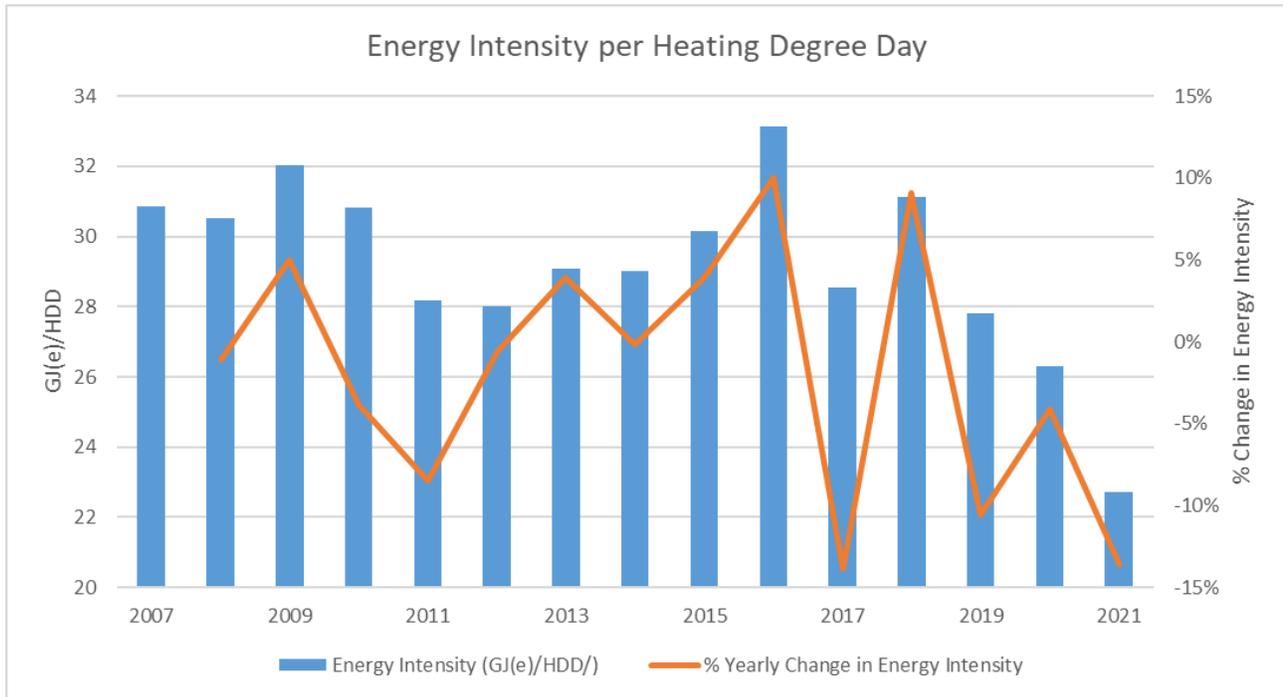
Heating Degree Days (HDD) are a significant factor when analyzing energy consumption. A cooler winter generally results in more HDD and higher energy consumption. The adoption of MERV-13 filters is increasing energy use because equipment must “work harder” to maintain air flow. In School District 72, only two elementary schools rely on electric heat. Therefore, the influence of the heating season is most noticeable on fossil fuel consumption.

Conversely, a warm summer (i.e. higher Cooling Degree Days) will generally result in higher energy consumption because of air conditioning equipment and use of electrical fans for occupant comfort. In the case of School District 72, however, few facilities are air conditioned and occupied during the cooling season. Therefore, Cooling Degree Days are not a significant contributor to energy consumption.



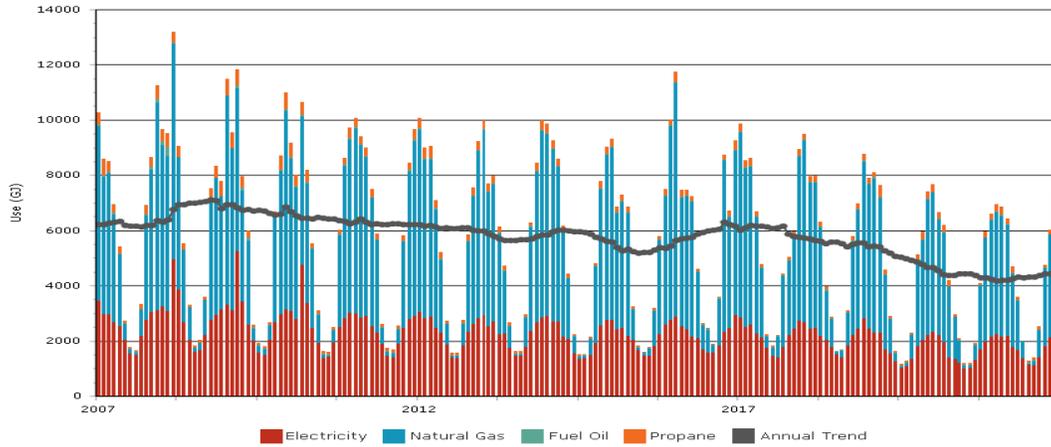
Energy vs. Degree Days report produced by Steve Woods on 02/28/2022 at 6:51 PM. Data prorated by month based on line item from/thru dates.

The following chart normalizes energy intensity using Heating Degree Days (HDD). Since 2007, the benchmark year under the Greenhouse Gas Reduction Targets Act, School District 72 has achieved a 26% reduction in overall energy intensity per HDD. This metric reinforces the importance of improving heating efficiency through mechanical upgrades.



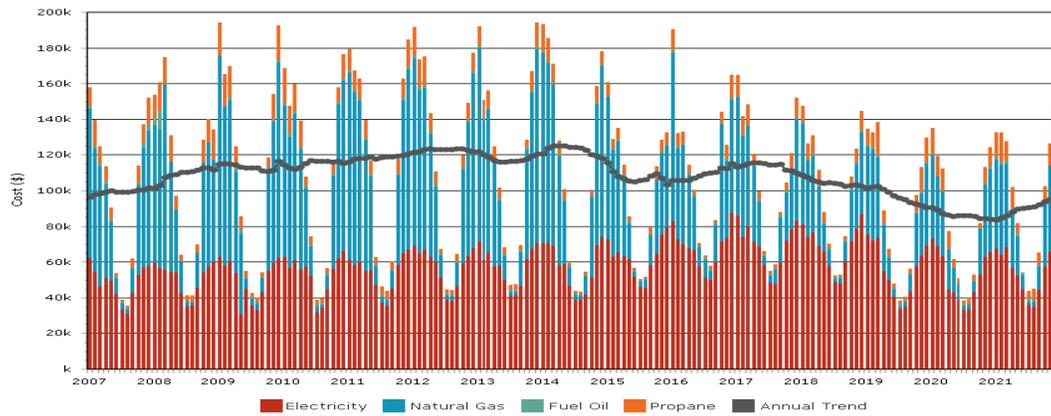
The following charts summarize energy use and cost trends since 2007, the benchmark year of the Greenhouse Gas Reduction Targets Act. Comparing 2021 and 2007, overall energy use has decreased by 29%. This decrease has offset energy rate increases. This reinforces the financial benefits of energy conservation and allows more educational dollars to be invested into the classroom.

Energy Use Trend
School District #72 (Campbell River)
All Facilities -- 1/2007 to 12/2021



Energy Use Trend report produced by Steve Woods on 02/28/2022 at 6:37 PM.
 Data prorated by month based on line item from/thru dates.

Energy Cost Trend
School District #72 (Campbell River)
All Facilities -- 1/2007 to 12/2021



Energy Cost Trend report produced by Steve Woods on 02/28/2022 at 6:37 PM.
 Data prorated by month based on line item from/thru dates.

4.2 Completed Energy Conservation Projects in 2021

Completed 2021 projects with the highest energy conservation impacts are summarized in the following table.

Location	Description	Cost	Funding Source(s)	Comments
Penfield Elementary	Life cycle replacement roof	\$975,000	Ministry of Education	Improved roof R-value and reflectivity in conjunction with roof replacements
Surge Narrows	Remove skylights	\$17,400	Annual Facilities Grant	Improved roof R-value
Carihi High	Life cycle replacement of boilers	\$250,800	Ministry of Education; Annual Facilities Grant	Conversion to high efficiency boilers in conjunction with life cycle replacement
Penfield Elementary	Life cycle replacement of 4 unit ventilators	\$161,400	Annual Facilities Grant	Life cycle replacement of ventilators and upgrade heating controls
Cedar Annex	Life Cycle replacement of four roof sections	\$238,900	Annual Facilities Grant	Improved roof R-value and reflectivity in conjunction with roof replacements

4.3 Energy Conservation Targets 2022 and Beyond

School District 72 has consistently achieved energy conservation and greenhouse gas reductions targets by taking full advantage of opportunity funding and external grants. Going forward, energy conservation initiatives will strive for an ongoing 2% reduction in energy consumption per year. To achieve this goal, the Annual Facilities Grant, Major Capital Program, Carbon Neutral Capital Program and School Enhancement Program will consider and incorporate energy conservation opportunities when developing school renewal projects.

Planned 2022 life-cycle replacement projects with the highest energy conservation opportunities are summarized in the following table.

Location	Description	Preliminary Budget	Funding Source(s)	Comments
Southgate Middle	Life Cycle replacement of three roof sections	\$615,000	Ministry of Education	Improved roof R-value and reflectivity in conjunction with roof replacements; includes safety improvements
Robron Centre	Replace Controls and valves	\$289,000	Ministry of Education	Improved controls for mechanical heating systems
Quadra School	Mechanical upgrade of west wing	\$349,000	Ministry of Education	Life cycle replacement of main air handling unit and controls upgrades
Ripple Rock Elementary	Life cycle replacement of boilers	\$133,000	Ministry of Education	Conversion to high efficiency boilers in conjunction with life cycle replacement
Quadra Elementary	Installation of Photovoltaic Panels	\$10,500	iCan Community Association	Demonstration project with educational opportunities

4.4 Impact on Greenhouse Gas Emissions

The Climate Change Accountability Act (2018) includes a 2030 target of a 40% reduction in greenhouse gas emissions relative to 2007. As of 2021, School District 72 has achieved a 16% reduction. To reach carbon neutrality, carbon offsets are purchased.

The notable reduction in 2020 greenhouse gas emissions was the result of actions taken to mitigate the risk of COVID-19. For example, school buses did not operate while in-class instruction was suspended and there was reduced activity in schools. School District activity returned to near normal in 2021.

Further reductions in greenhouse gas emissions will be pursued through life-cycle replacement of major building components that leverage high energy efficiency technologies. Additionally, School District 72 will monitor for incentive programs supporting the purchase of electric vehicles. (eg. CleanBC, PluginBC Specialty Use Vehicle Program). Finally, community engagement includes a strong partnership with the City of Campbell River and community sponsored projects such as the photovoltaic solar energy demonstration project at Quadra school.

