

Strategic Energy Management Plan 2021

School District 72 (Campbell River)



Contents

1.0	Our Organization	1
1.1	Facility Profile	1
2.0	Our Commitment	3
2.1	Why is energy conservation important to us?	3
2.2	Operational Procedure 515 – Environmental Responsibility	3
3.0	Understanding Our Situation	5
3.1	Utility Consumption and Costs	5
3.2	Savings Opportunity Assessment - Energy Consumption Intensity	6
4.0	Our Actions	8
4.1	Program Results 2007-2020	8
4.2	Completed Energy Conservation Projects in 2020	11
4.3	Energy Conservation Targets 2021 and Beyond	11
4.4	Impact on Greenhouse Gas Emissions	12

1.0 Our Organization

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

This report provides an overview of our school district's energy consumption, including financial impacts, 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. It facilitates comparison of different buildings over time. In 2020, our Energy Intensity decreased by another 9% compared to 2019. The most significant decreases were Phoenix Middle School (boiler replacement with high efficiency boilers) and Surge Narrow School (replacement of school generator). Space heating is the most significant energy requirement for School District 72. Heating Degree Days in 2020 were 6% less than 2019.

The impact of COVID-19 on energy consumption is unclear. Although most schools had lower energy intensity, a few schools experienced an increase. Greenhouse gas emissions from fleet operations decreased significantly due to curtail school bus operations.

The following table summarizes the energy consumption, cost and energy intensity for all School District 72 facilities.

Facility Profile

Site	Size m ²	2020 Annual Energy Consumption GJ (e)	2020 Annual Energy Cost (\$)	2020 Energy Intensity GJ (e) per m ²	2019 Energy Intensity GJ (e) per m ²	2018 Energy Intensity GJ (e) per m ²
Carihi	10,533	7,385	109,964	0.70	0.76	0.78
Cortes	1,382	942	41,327	0.68	0.69	0.67
Cedar	2,389	1,736	27,880	0.73	0.82	0.80
Discovery Passage	1,602	970	14,518	0.61	0.58	0.61
EDM	2,409	1,420	23,165	0.59	0.66	0.63
Georgia Park	3,375	2,177	41,767	0.65	0.71	0.68
Maintenance/Bus Garage (incl 3 portables)	2,068	907	21,292	0.44	0.45	0.40
Ocean Grove (incl 3 portables)	2,769	1,707	31,906	0.62	0.67	0.79
Oyster River	2,106	1,363	25,003	0.65	0.65	0.71
Penfield	2,918	1,360	46,403	0.47	0.43	0.48
Phoenix (incl 1 portable)	8,370	4,392	71,678	0.52	0.69	0.64
Pinecrest	3,221	1,984	33,362	0.62	0.61	0.51
Quadra	2,647	1,037	35,360	0.39	0.41	0.43
Ripple Rock (incl 2 portables)	2,890	2,109	34,359	0.73	0.75	0.72
Robron	6,906	3,896	70,415	0.56	0.64	0.70
Sandowne	3,581	1,976	39,997	0.55	0.64	0.62
Sayward	2,977	1,618	70,145	0.54	0.51	0.56
School Board Office (incl 1 portable)	1,824	1,716	52,555	0.94	0.87	0.86
Southgate	7,373	3,819	70,663	0.52	0.50	0.51
Surge Narrows (incl Community Use)	530	157	4,901	0.30	0.68	0.73
Timberline (incl 1 portable)	9,261	5,657	95,918	0.61	0.74	1.05
Willow Point	2,772	1,921	32,544	0.69	0.74	0.74
TOTAL	83,902	50,249	995,122	0.60	0.66	0.73

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 one focus of the 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 (incentive programs), Natural Resources Canada (provision of benchmarking data through surveys), and the BC Climate Action Secretariat (Climate Change Accountability Reports).

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

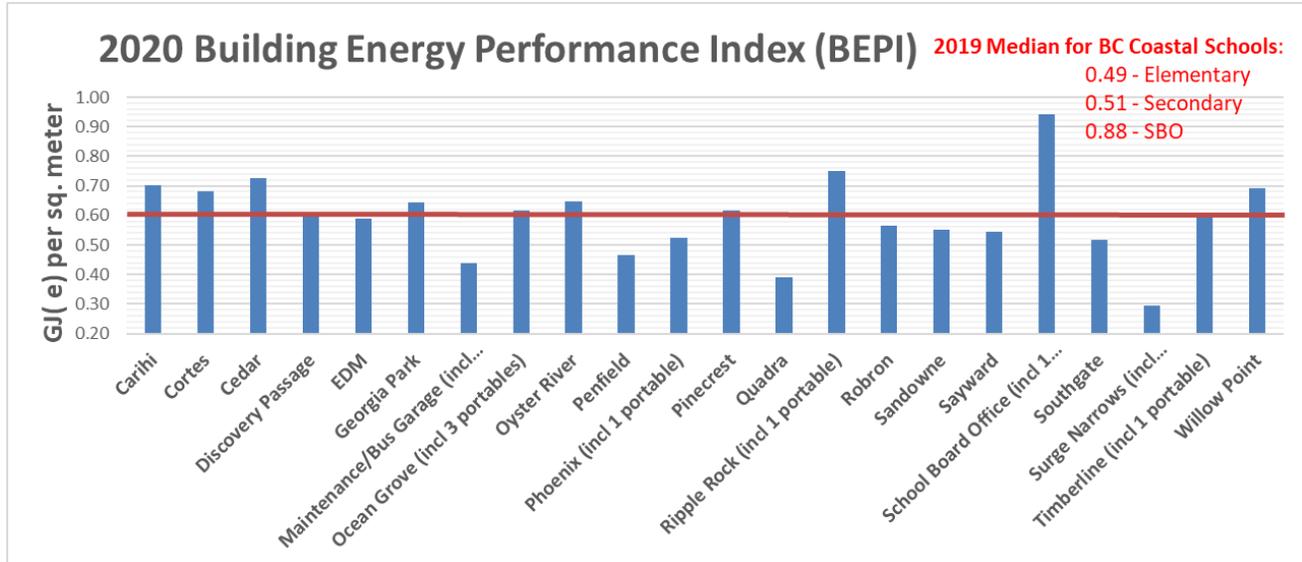
Referring to the following table, electricity is the largest component of School District 72 utility costs. This fact contributed to the school district decision to become a member of the BC Hydro Energy Manager program from 2009 to 2015. During this period, lighting upgrades were completed throughout 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.

In addition to energy consumption, School District 72 proactively manages other types of utilities. The 2015 pilot project to connect irrigation controls to the University of Victoria's School-Based Weather Station Network has continued, with one site per year receiving irrigation controllers so playing fields are only watered when weather dictates. As part of a partnership with the City of Campbell River for solid waste collection, recycling collection has continued to expand.

2020 Calendar Year	Normalized Consumption	Normalized Costs	
	GJ	\$	%
Electricity	30,719	375,308	29.1%
Natural Gas	28,793	285,499	22.1%
Propane (buildings)	1,769	84,908	6.6%
Diesel (marked)	158	4,901	0.4%
Water, excl irrigation	35,200 m ³	33,738	2.6%
Irrigation	26,695 m ³	18,153	1.4%
Sewage	23,085 m ³	43,967	3.4%
Refuse	2,214 Tons	43,103	3.3%
Recycling	404 Tons	16,754	1.3%

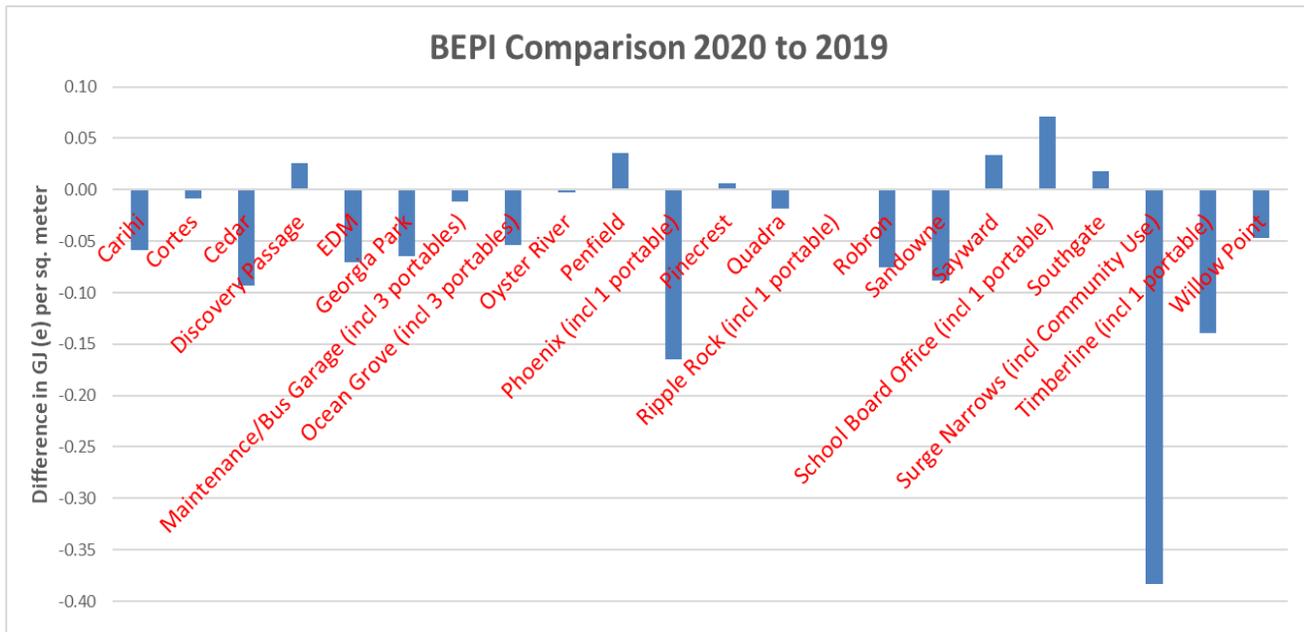
3.2 Savings Opportunity Assessment - Energy Consumption Intensity

Although the School District 72 Building Energy Performance Index (BEPI) in 2020 improved by 9% compared to 2019, 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 2020, the three buildings in School District No. 72 with the highest BEPI were:

- Ripple Rock Elementary. Despite the addition of a portable and an increase in student population, the BEPI remained unchanged from 2019. Life-cycle replacement of the boilers is included in the Capital Plan, which is expected to decrease energy consumption.
- School Board Office. School Board Offices typically have high energy intensity relative to other school district facilities. For 2020, a large increase in staff reflects the increase in energy use compared to 2019.
- Cedar Elementary. Natural gas consumption is the primary contributor to the high energy consumption, suggesting an adjustment is needed in heating controls or underlying building envelope issues in this 63 year old school. Potential long term solutions include replacement of the school or upgrades to the building envelope.



School District 72 buildings with the greatest BEPI increase in 2020 were:

- a. School Board Office. An 8% increase in the BEPI reflects a significant staffing increase.
- b. Penfield Elementary. Roof replacement of the entire building is scheduled for 2021, as well as replacement of four classroom unit heaters.
- c. Sayward School. Replacement of the boilers has been identified as a priority to address ongoing issues with the school boilers.
- d. Discovery Passage. Although a closed school, the building is now partially occupied by the maintenance sign shop. Additionally, as part of COVID-19 protocols, school furniture was relocated to the building for storage. This increase heating and lighting requirements.

Significant BEPI decreases were the result of projects completed part-way through 2019:

- a. Surge Narrows School. Replacement of the school generator has significantly reduced diesel consumption for this small school. The generators provide electrical power for the building, including electric baseboard heaters.
- b. Phoenix Middle. Life cycle replacement of boilers with high efficiency boilers was supported with a FortisBC grant.
- c. Timberline High. Separation of the high school and North Island College energy consumption is being monitored through the installation of electrical sub-meters. Prior to 2019, no metering was in place to quantify the energy consumption of each organization.

4.0 Our Actions

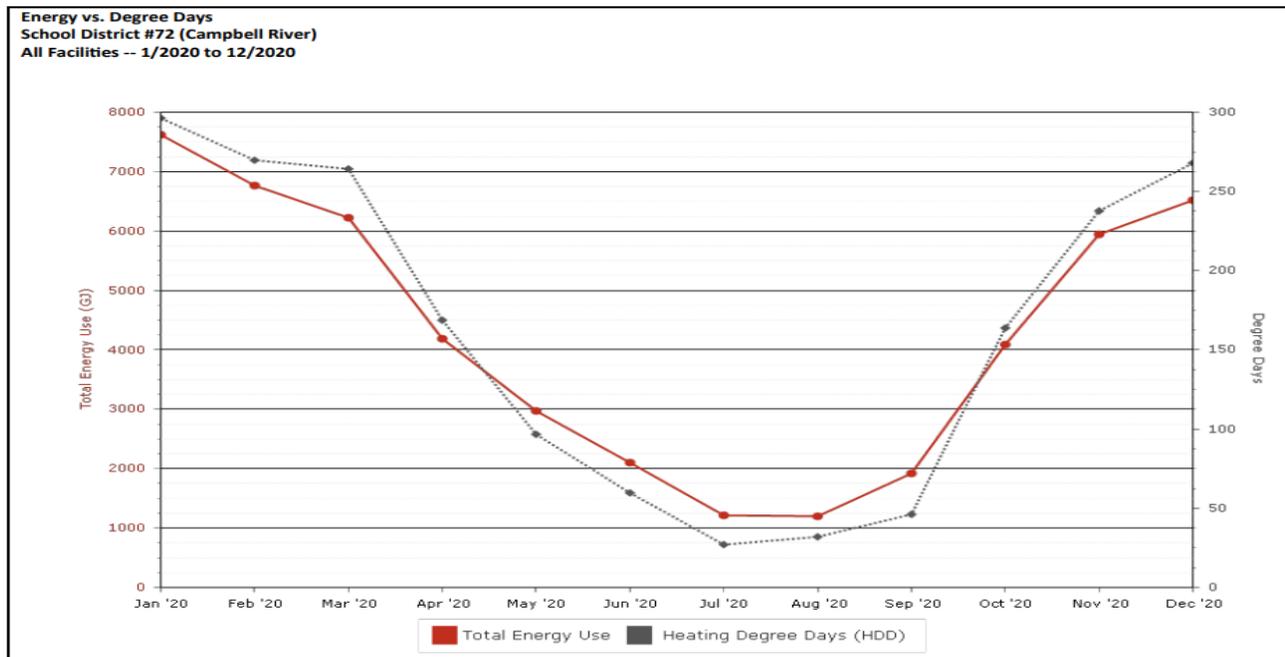
4.1 Program Results 2007-2020

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.

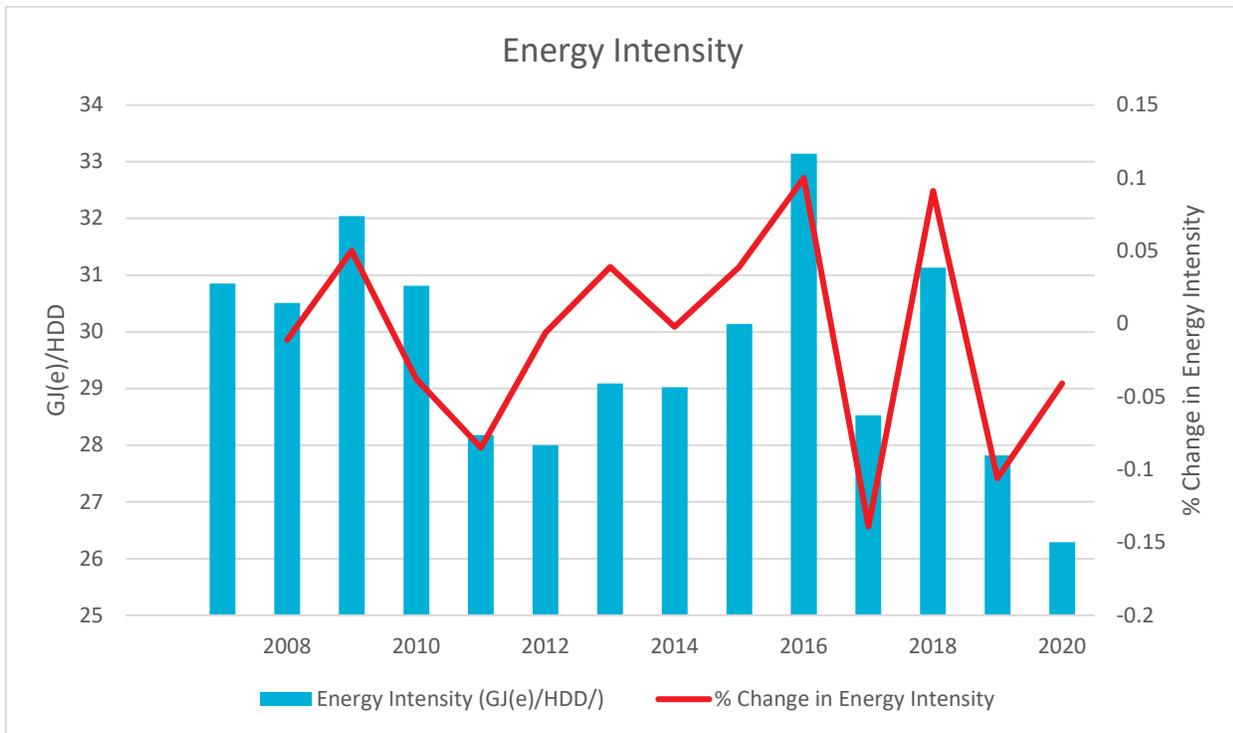
Energy Intensity by Heating Degree Days (HDD)

Heating Degree Days (HDD) are a significant factor when analyzing energy consumption. A cooler winter generally results in more HDD and higher energy consumption. 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 high 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.

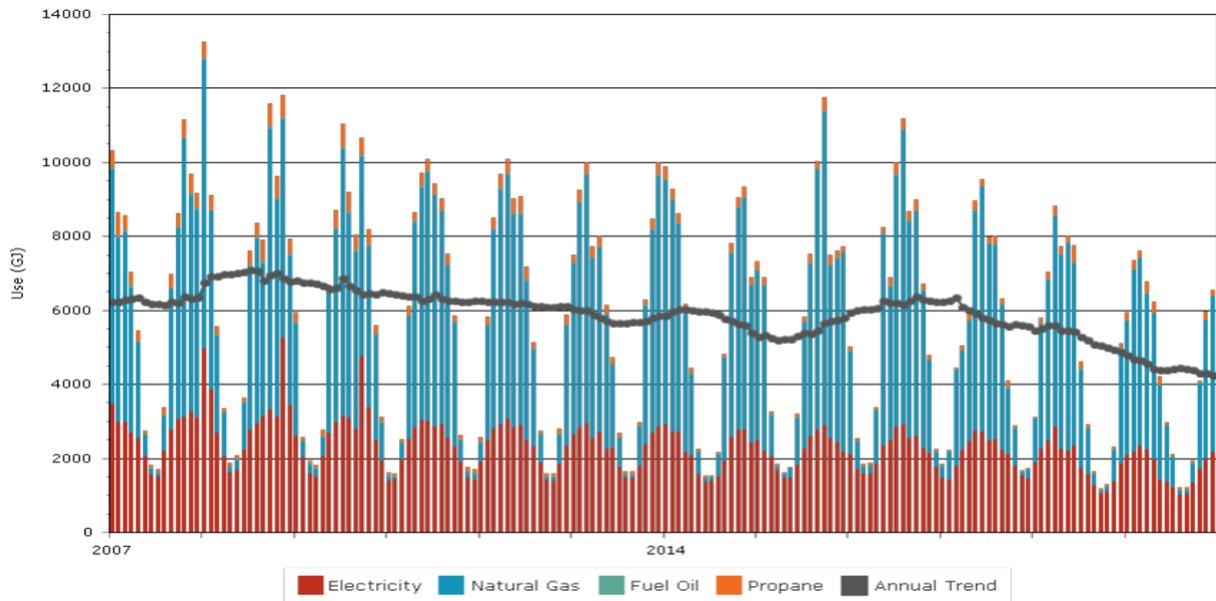


The following chart normalizes energy intensity using Heating Degree Days (HDD). Since 2007, the benchmark year under the Greenhouse Gas Reduction Targets Act, School District 72 has achieved a 13.5% reduction in overall energy intensity per HDD. This comparison reinforces the importance of a proactive energy management program to identify and implement energy conservation measures and efficiencies.

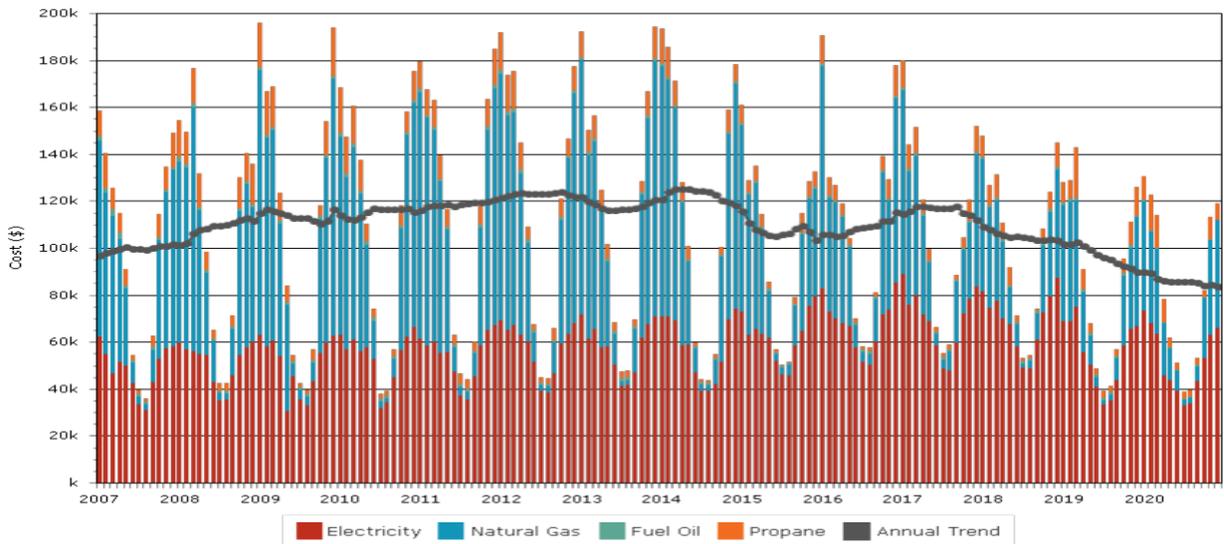


The following charts summarize energy use and cost trends since 2007, the benchmark year of the Greenhouse Gas Reduction Targets Act. Comparing 2020 and 2007, overall energy use has decreased by 30%. This more than offset increases in energy rates, resulting in a 14% reduction in the overall annual cost trend. This reinforces the financial benefits of energy conservation and enables more educational dollars to be invested into the classroom.

Energy Use Trend
School District #72 (Campbell River)
All Facilities -- 1/2007 to 12/2020



Energy Cost Trend
School District #72 (Campbell River)
All Facilities -- 1/2007 to 12/2020



4.2 Completed Energy Conservation Projects in 2020

Completed 2020 projects with the highest energy conservation impacts are summarized in the following table.

Location	Description	Cost	Funding Source(s)	Comments
Quadra Elementary	Life cycle replacement of six roof sections	\$314,350	Ministry of Education	Improved roof R-value and reflectivity in conjunction with roof replacements
Timberline Secondary	Life cycle replacement of four roof sections	\$524,412	Ministry of Education; Annual Facilities Grant	Improved roof R-value and reflectivity in conjunction with roof replacements
Ecole Willow Point Elementary	Life cycle replacement of boilers	\$171,444	Ministry of Education; Annual Facilities Grant	Conversion to high efficiency boilers in conjunction with life cycle replacement
Southgate Middle	Life cycle replacement gym unit ventilators	\$247,625	Annual Facilities Grant	Life cycle replacement of ventilators and upgrade heating controls

4.3 Energy Conservation Targets 2021 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 2021 life-cycle replacement projects with the highest energy conservation opportunities are summarized in the following table.

Location	Description	Preliminary Budget	Funding Source(s)	Comments
Replace Cedar Annex Roof	Life Cycle replacement of four roof sections	\$286,000	Annual Facilities Grant	Improved roof R-value and reflectivity in conjunction with roof replacements
Penfield Elementary Roof Replacement	Life Cycle replacement of entire school roof	\$975,000	Ministry of Education	Improved roof R-value and reflectivity in conjunction with roof replacements
Carihi Secondary	Life Cycle Replacement of boilers	\$248,000	Ministry of Education	Conversion to high efficiency boilers in conjunction with life cycle replacement

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 2020, School District 72 has achieved a 33% reduction. To reach carbon neutrality, carbon offsets are purchased.

Much of the 2020 reduction in greenhouse gas emissions is the result of actions taken to mitigate the risk of COVID-19. School buses did not operate while in-class instruction was suspended and there was reduced activity in schools.

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 support to the Quadra Island Network Society for a photovoltaic solar energy demonstration project at Quadra school.

Greenhouse Gas Emissions History

