

Strategic Energy Management Plan

School District No. 72 (Campbell River)

April 2016

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1. OUR ORGANIZATION

1.1 Facility Profile

Facility Profile						
Site	Size m ²	2015 Annual Energy Consumption GJ (e)	2015 Annual Energy Cost (\$)	2015 Energy Intensity GJ (e) per m ²	2014 Energy Intensity GJ (e) per m ²	2013 Energy Intensity GJ (e) per m ²
Carihi	10,533	8,276	122,550	0.79	0.81	0.75
Cortes	1,382	954	32,369	0.69	0.90	0.89
Cedar	2,389	1,885	33,374	0.79	0.83	0.90
Discovery Passage	1,602	1,275	21,352	0.80	0.76	0.76
EDM	2,409	1,652	25,192	0.69	0.61	0.65
Evergreen	1,330	239	4,865	0.18	0.23	0.18
Georgia Park	3,375	2,201	44,510	0.65	0.63	0.68
Maintenance/Bus Garage (incl 3 portables)	2,069	971	23,045	0.47	0.52	0.70
Ocean Grove	2,525	1,912	34,357	0.76	0.80	0.87
Oyster River	2,106	2,335	45,808	1.11	1.05	1.08
Penfield	2,933	1,311	34,979	0.45	0.51	0.54
Phoenix (incl portables)	8,501	4,804	79,024	0.57	0.59	0.62
Pinecrest	3,221	1,786	32,172	0.55	0.56	0.60
Quadra	2,628	1,201	38,811	0.46	0.43	0.33
Ripple Rock	2,725	1,729	33,645	0.63	0.62	0.68
Robron	7,154	4,089	75,170	0.57	0.62	0.67
Sandowne	3,581	2,476	45,145	0.69	0.83	0.87
Sayward	2,977	1,331	40,762	0.45	0.50	0.53
School Board Office (incl 1 portable)	1,824	1,455	40,735	0.80	0.81	0.91
Southgate	7,373	3,959	69,354	0.54	0.59	0.60
Surge Narrows (incl Community Use)	530	95	3,268	0.18	0.54	0.64
Timberline/NIC (incl portables and NIC)	16,073	17,207	312,701	1.07	1.07	1.07
Willow Point	2,772	1,833	32,731	0.66	0.65	0.68
TOTAL	92,011	64,975	1,225,919	0.71	0.73	0.75

2. OUR COMMITMENT

2.1 Why is energy conservation important to us?

Energy conservation awareness is considered an integral component of sustainable environmental practices and education curriculum. The Campbell River School District Strategic Plan reflects this belief by including specific objectives in support of various strategic focus areas.

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 a Strategic Focus of the Campbell River School District Strategic Plan. Environmental stewardship awards presented by the City of Campbell River, Union of BC Municipalities, and Campbell River Chamber of Commerce reflect the positive relationships with our 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 Energy Star program), and the BC Climate Action Secretariat.

2.2 Environment Responsibility Policy

School District No. 72 (Campbell River) adopted the following Environment Responsibility Policy B-15 on June 23, 2009.

The Board of Education has a responsibility towards sustainable environmental stewardship.

The Board of Education is committed to raising environmental awareness of all staff, students, trustees and the community by delivering effective environmental education and modeling environmentally responsible practices (with respect to wise water use, energy-use reduction and waste minimization). The Board will endeavour to:

- Provide teachers with environmental education resources
- Align what is taught in the classrooms with school operations (curriculum, transportation and facilities)
- Reduce its impact on the environment
- Recognize successful environmental initiatives and programs.

The Board of Education expects that:

- The School district will consistently consider the impact of the environment of decisions that are made in the delivery of curriculum and in daily operations
- Schools will integrate environmental education and environmentally responsible action within the school setting.

The Board of Education authorizes the establishment of an Environmental Awareness Focus Group, which will set goals in relations to

- Environmental education
- Effective implementation of sustainable environmental practices
- Ongoing measurement and evaluation of environmental performance.

Definitions

“Environment” is the surroundings in which an organization operates including air, water, land, natural resources, flora, fauna, humans and their inter-relations.

“Environmental Education” refers to organized efforts to teach about how natural environments function and, particularly, how human beings can manage their behaviour and ecosystems in order to live sustainably. Although the term is often used to imply education within the school system, from primary to post-secondary, it is sometimes used more broadly to include all efforts to educate the public and other audiences, including the use of print materials, websites, media campaigns, etc. Related disciplines include outdoor education and experiential education.

“Impacts on the environment” are any changes to the environment whether adverse or beneficial, wholly or partially resulting from an organization’s products or services.

“Sustainable means practices that serve to meet the needs of the present without compromising the ability of future generations to meet their own needs.

“Stewardship” is the act of caring for something that one doesn’t own.

2.2.1 Environment Responsibility Regulation

Background

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

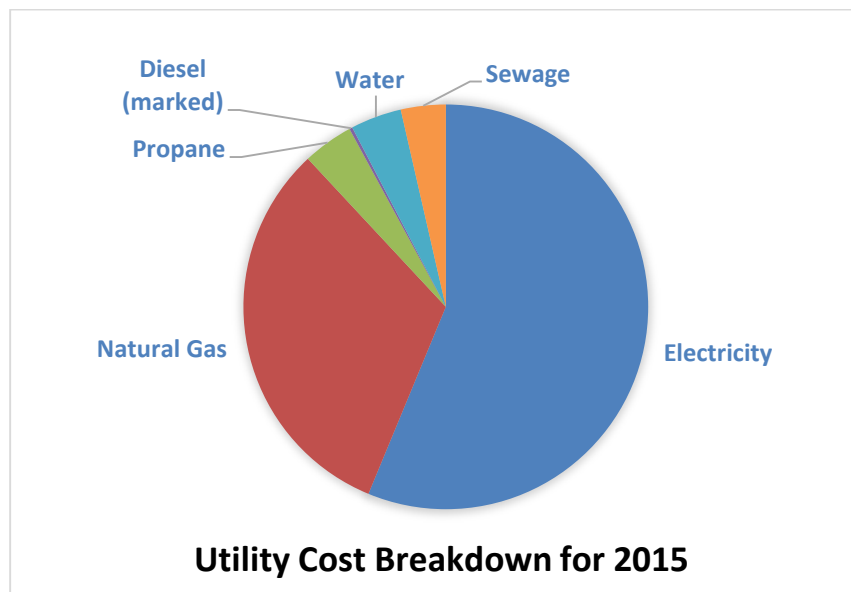
Procedures

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. UNDERSTANDING OUR SITUATION

3.1 Energy Consumption and Costs

Utility 2015 Calendar Year	Normalized Consumption	Normalized Costs	
	GJ	\$	%
Electricity	25,923	747,027	56.2
Natural Gas	37,359	422,559	31.8
Propane	1,575	53,614	4.0
Diesel (marked)	95	3,268	0.2
Water, incl irrigation	100,049 m ³	54,106	4.1
Sewage	43,729 m ³	47,551	3.7
Total Energy	64,952 GJ	\$1,328,125	100

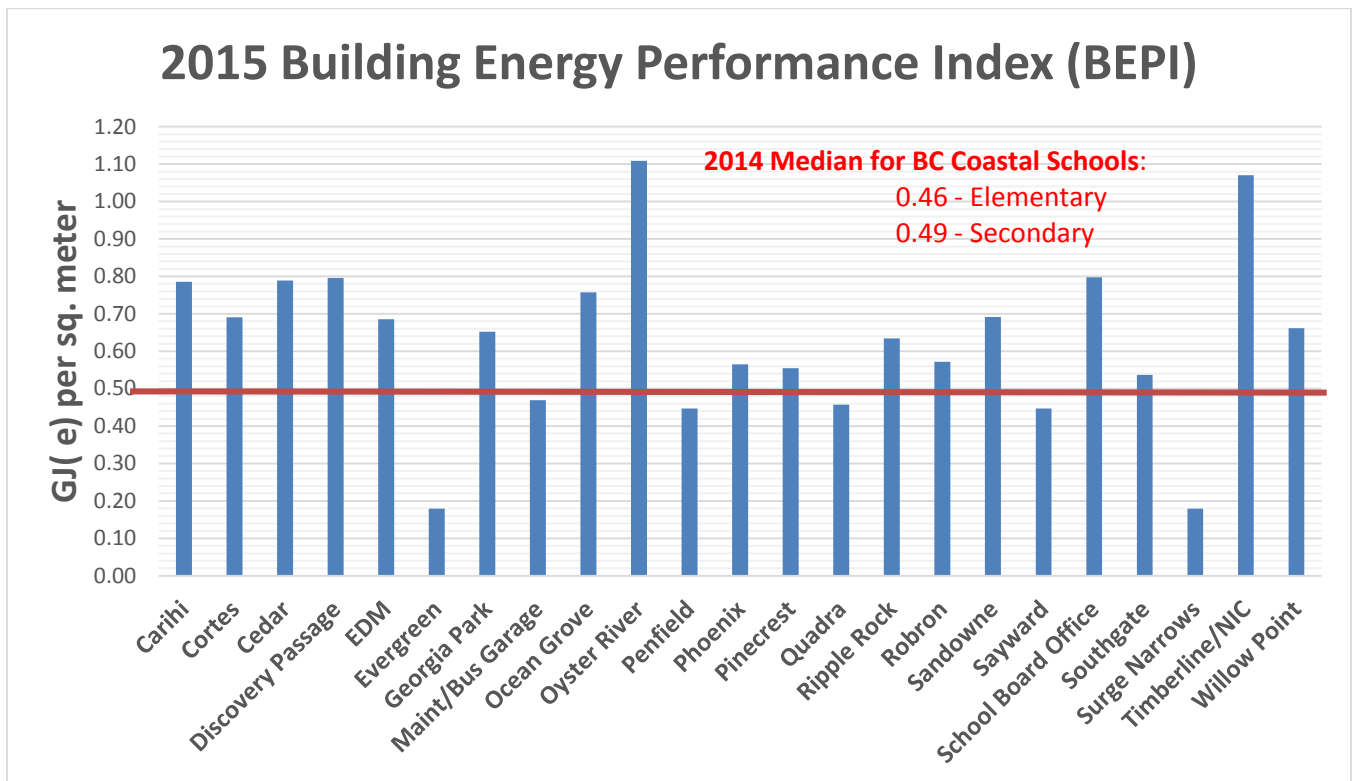


3.2 Savings Opportunity Assessment - Energy Consumption Intensity

School District 72 has achieved reductions in energy consumption per square meter for several years. Nevertheless, a comparison with BC coastal schools suggests additional targeted energy conservation initiatives will result in significant savings. For 2015, six locations had a Building Energy Performance Index (BEPI) below the median for BC coastal schools.

For 2015, the buildings in School District No. 72 with the highest BEPI are:

- a. Timberline/North Island College. This facility is jointly occupied with North Island College, with many educational programs and not found elsewhere in the school district. Despite the introduction of new, energy intensive North Island College programs (e.g. robotics, jewelry making), the BEPI for this facility has remained relatively unchanged in recent years. Exterior lighting upgrades were completed in early 2015, allowing the BEPI to remain stable despite changing education programs at the site. North Island College is undertaking a site redevelopment and expansion initiative which, upon completion, is expected to significantly increase energy consumption.
- b. School Board Office. Although energy consumption has decreased significantly since lighting upgrades were completed several years ago, further reductions have been limited by architectural features of this building (constructed in the 1980s). A building envelope upgrade will be completed by mid-2016. This project includes several energy conservation features including a reduction in the amount of glazing, modernization of glazing materials, use of insulating window shades, and a reduction in the number exterior doors.
- c. Oyster River Elementary. The BEPI for this a small school increased significantly in 2015. As evidenced by catastrophic failure of an antiquated roof top heating unit in early 2016, the school's heating system is the primary reason for high energy consumption. Planning is underway to replace the failed roof top heating unit with a high efficiency heat pump. Pending replacement, however, electrical heating units are being used on an interim basis to maintain satisfactory heat levels in the building.

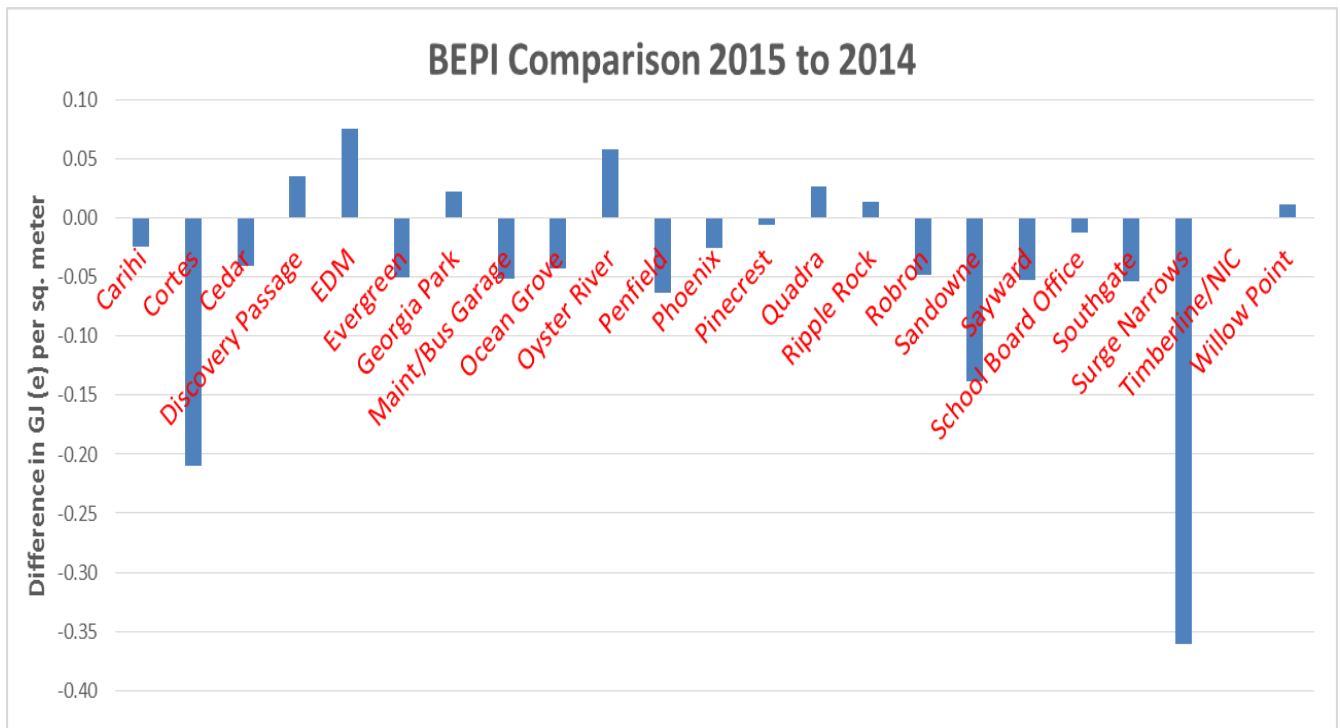


School District 72 buildings with the lowest BEPI in 2015 are:

- a. Surge Narrows. This small school uses a diesel electric generator for energy needs. Due to timing of fuel deliveries to this remote site, only one fuel delivery was required in 2015, resulting in a one-time drop in the BEPI.
- b. Evergreen Property. This building is vacant, with only marginal heat being provided.
- c. Penfield Elementary and Sayward Elementary. These schools had identical BEPI in 2015. In the case of Sayward, low student enrollment is a significant contribution towards low energy consumption. Penfield Elementary had a catastrophic failure of a classroom unit heater in 2015. While work is continuing to replace the heater, the affected classroom remains unoccupied and unheated.

The sites with the greatest BEPI increase in 2015 were Ecole Des Deux Mondes (EDM), Phoenix Middle and Oyster River Elementary.

- a. Oyster River Elementary. As previously mentioned, the roof top heating units require immediate replacement and one roof top heating unit failed completely in 2015. Work is in progress to replace the failed roof top heating unit.
- b. EDM Elementary. Both heating and electrical consumption increased in 2015. Heating Degree Days decreased in 2015 compared to 2014, but student population increased slightly. This suggests the increase in energy consumption is due to changing educational programs and activities in the school.
- c. Discovery Passage. Increased electrical consumption is the primary contributor to the 2015 BEPI increase. Increased electrical consumption is most noticeable between May and October, suggesting greater use of portable fans or after school activities.



4. OUR ACTIONS

4.1 Program Results 2007-2015

The Greenhouse Gas Reduction Target Act (2007) articulated B.C.'s public sector commitment to meeting the challenge of climate change. For many school districts, including School District 72, this commitment was a natural extension of initiatives already in progress: increasing utility costs were diverting funds away from the classroom while environmental sustainability is an increasing educational priority. Community expectations, such as the City of Campbell River's Community Energy and Emissions Plan (25% reduction in community greenhouse gas emissions by 2020), also signaled the importance of developing strategic partnerships with external stakeholders. For School District 72, the provincial mandate for net-zero emissions and a greenhouse gas reduction target of 33% by 2020 provided a renewed focus on our carbon reduction journey.

The Senior Management Team and Board of Trustees paved the way for efforts to reduce our carbon footprint by adopting an Environmental Responsibility Policy, supporting the development of sustainability guidelines, and sponsoring initiatives such as renewal of our strategic partnership with BC Hydro. Under the umbrella of BC Hydro's Energy manager program, an Energy Management Assessment identified priority areas that would lead to rapid decreases in energy consumption and greenhouse gas emissions. A Strategic Energy Management Plan identified a wide variety of infrastructure projects, promoted initiatives to engage students and staff, and facilitated community outreach efforts.

Infrastructure projects offered the greatest opportunities (and challenges) for School District 72 to reduce greenhouse gas emissions. Constrained by stagnant funding levels in the Annual Facilities Grant while losing purchasing power through cost escalation, external grants and rebates were a priority. Fortunately, most funding requests were successful and School District 72 received an average of over \$415,000 per year from 2010/11 to 2014/15 (equivalent to more than one-third of the Annual Facilities Grant). Funding sources ranged from organizations such as Solar BC, Natural Resources Canada, North Island College, and utility companies, to programs including the Public Sector Energy Conservation Agreement (PSECA) and the Carbon Neutral Capital Program (CNCP). Additionally, School District 72 was able to leverage multiple seismic upgrade, Information Technology, and building envelope projects. The result was improved learning conditions at all schools and significant reductions in energy consumption and greenhouse gas emissions.

School Districts are "people" organizations and staff engagement is essential. The Environmental Awareness Focus Group provided teachers and support staff with an opportunity to learn of projects, identify new initiatives, and receive feedback on progress towards carbon neutrality. Tools developed since 2009 have included the availability information including energy consumption reports, Energy Star labeling for schools and the distribution of Statistics Canada survey results of Commercial and Institutional Energy Use (including counts of domestic appliances). Custodial Pro-D sessions typically reinforce the key role of custodial staff and the benefits of using green cleaning products, 100% biodegradable garbage bags, and monitoring for lights and appliances that have been left on.

Students have a number of opportunities to learn, practice and contribute environmental sustainability. In 2009, the EcoSchools initiative was launched to help schools establish eco-teams and develop student-led campaigns and activities (e.g. energy conservation challenges, Earth Hour school assemblies, etc). BC Hydro Schools Programs are routinely offered to teacher and students. School District 72 partnered with the City of Campbell River and RCMP as a signatory to the 2012 Youth Charter, providing the City's Youth Action Committee (students in

grades 9 to 12) an opportunity for direct input on community issues and projects, including a specific focus on environmental protection, climate change and energy conservation. A network of community gardens has developed on school properties which provide students outdoor learning opportunities. Located minutes from Campbell River, and with funding support from BC Hydro, BC Hydro's John Hart project has provided many educational opportunities in the fields of engineering and natural sciences, as well as the culture of the community and local First Nations.

School District 72 the largest employer in the Campbell River area, and continued strengthening of community relations is a Strategic Focus in the District Strategic Plan. Collaboration with the City of Campbell River has been ongoing and diverse: projects have included using school sites for wind energy feasibility studies, school submissions for the Annual Earth Week Film Festival, joint tendering of commercial solid waste and recycling collection (resulting in savings of over 20% in waste collection costs and eliminating need to sort recyclables), participation in the City's Communities in Bloom program, and participating in development of the Community Energy and Emission Plan. In partnership with North Island College and the City of Campbell River, public access Level 2 electric vehicle charging stations were installed at the Heritage Lands facility. A solar hot water system was incorporated into the mechanical upgrades supporting the North Island College teaching kitchen. School District 72 joined the University of Victoria's school-based weather station network. This partnership is resulting in real time weather information throughout the school district, additional educational resources, and a pilot project to use the data to control irrigation systems indicates an opportunity to reduce irrigation water consumption by approximately 18%.

As exemplified by the City of Campbell River Award for Energy Conservation (2011) and the 2013 Community Energy Association present to the City of Campbell River and School District 72, School District 72's efforts have received recognition within the community. Perhaps more importantly, however, School District 72 completed 2015 by reaching the Provincial target of a one-third reduction in greenhouse gas emissions, relative to 2007 levels. Going forward, School District 72 remains committed to onto reduction of greenhouse gas emissions. Work in progress includes a building envelope upgrade to the School Board Office, a multi-year program for unit heater upgrades in classrooms, and planning for major mechanical system upgrades.

Energy Intensity by Heating Degree Days (HDD)

Heating Degree Days are a significant factor when analyzing energy consumption. A cooler winter generally results in higher energy consumption. In School District 72, only two elementary schools rely on electric heat. Therefore, the influence of warmer winters 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, only the School Board Office and Heritage Lands facility are air conditioned and occupied for most of the cooling season. Therefore, Cooling Degree Days have a relatively small impact on energy consumption.

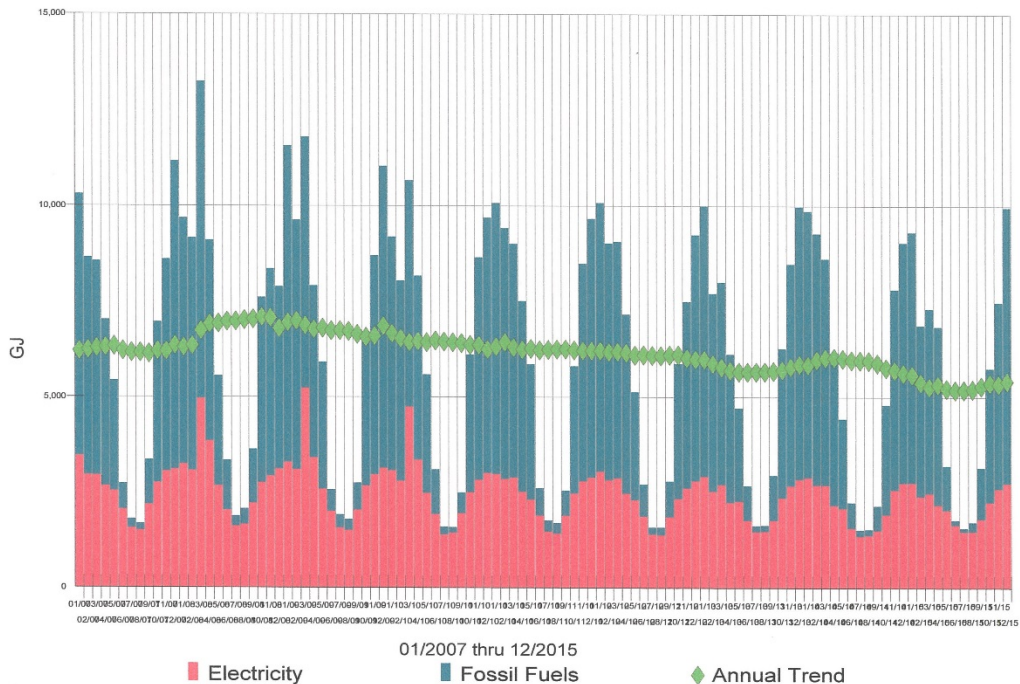
The following charts provide a profile of School District 72 energy consumption. They show a steady decrease in energy consumption since the school district joined the BC Hydro Energy Manager program in 2009. However, much of the decrease can be attributed to warmer winters and resulting decreases in fossil fuel consumption. With this understanding of our of energy

consumption requirements, most School District 72 energy conservation efforts have been focused on electrical consumption, which are less dependent on weather.

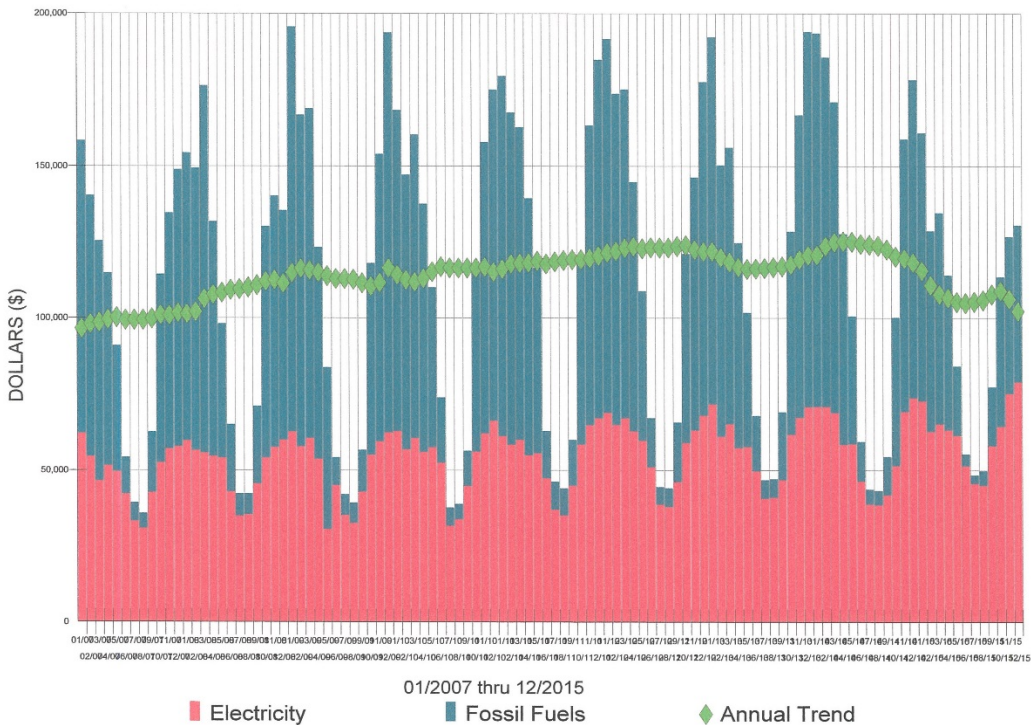
Year	Annual Normalized Energy Consumption (GJ(e))	HDD	Energy Intensity (GJ(e)/HDD)	Percent Change in Energy Intensity (%)
2006	72,371	3153	22.95	
2007	76,264	3066	24.87	8.4%
2008	81,521	3363	24.24	-2.5%
2009	82,275	3116	26.40	8.9%
2010	74,901	2761	27.13	2.7%
2011	74,485	3192	23.33	-14.0%
2012	71,795	2723	26.37	13.0%
2013	70,210	2584	27.17	3.1%
2014	67,475	2461	27.45	0.9%
2015	64,956	2410	27.23	-1.7%
Total (Current Year to 2009 start of Energy Manager Program)				2.1%

While energy consumption has steadily decreased, energy costs have increased. BC Hydro rate increases are the primary cause of cost increases. Fossil fuel costs (primarily natural gas) have begun to decrease as a result of FortisBC rate adjustments affecting Vancouver Island customers.

Energy Use Graph – Monthly and Annual Trend since 2006



Energy Cost Graph – Monthly and Annual Trend



4.2 Energy Conservation Targets 2016 and beyond

As indicated in section 4.1, School District 72 has consistently exceeded energy conservation and greenhouse gas reduction targets by taking full advantage of opportunity funding and external grants. Going forward, energy conservation initiatives will strive for continuous improvement of a 2% reduction per year. To achieve this goal, the Annual Facilities Grant, Capital Program, and School Enhancement Programs will prioritize energy conservation projects when considering school renewal projects.