

Bruce-Grey Catholic District School Board



Energy Conservation and Demand Management Plan

2013-14 to 2017-18

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Bruce-Grey Catholic District School Board

Energy Conservation and Demand Management Plan 2013-14 to 2017-18

Education Sector Background

Funding and Energy Management Planning

All Boards receive 100% of their funding from the Ministry of Education. The Ministry announces each Board's funding allocation in March for the next Fiscal Year which runs from September 1st to August 31st. The Ministry does not provide Boards with multi-year funding allocations.

While a Board may have a five-year energy management strategy, the Board's ability to implement their strategy is dependent on the funding that they receive in each of the five years covered by their energy management plan.

Asset Portfolios and Energy Management Planning

Energy consumption at a site can be impacted by a number of variables. The following list provides examples that may impact changes in consumption at a site from one year to the next. These examples will play a significant role in the Board's assessment of energy management priorities.

Facility Variables

- Year of Construction
- Building Area
 - Major additions
 - Sites sold
 - Portables
 - installed
 - removed
- Site Use
 - Elementary school
 - Secondary school
 - Administrative building
 - Maintenance/warehouse facility
- Shared Use Sites with another partner such as a municipality
 - Child Care
- Equipment/Systems
 - Age

- Type of technology
- Lifecycle
- % air conditioned building area

Other Variables

- Programs
 - Day care
 - Before/After School Programs
 - Summer School
 - Community Use
- Occupancy
 - Significant Increase or decrease in number of students
 - New programs being added to a site
 -

About the Board

The following statistics apply to the Board's Fiscal Year 2013-14

Total Number of Sites: 14

Total Number of Students: 3543

Background

1. The Board has a qualitative energy conservation goal as specified in Administrative Procedure 6-5 Environmental Stewardship.

"The Board will:

- utilize natural light
- promote the use of sleep mode or OFF when all lights, computers, monitors and other electronic equipment are not in use
- implement equipment consolidation practices (i.e. computer networking) to ensure energy conservation
- ensure that windows are closed at the end of the school day
- ensure that space around vents, windows and doors are kept free from obstructions, that windows and doors are closed when possible and that weather stripping is examined for deficiencies and replaced when necessary
- ensure that schools, during the heating season, adhere to Board standard room temperatures of 21 degrees Celsius or less and 15 degrees Celsius during weekends and school breaks
- promote the reduction of heat in areas not being utilized

- make maximum use of its computer controlled temperature systems
- encourage staff to turn off air conditioning when building is not utilized
- ensure that air conditioners are not set lower than 10 degrees Celsius below outside temperature
- consider the use of energy efficiency products (i.e. compact fluorescent light bulbs)
- consider the use of renewable sources of energy (i.e. solar/wind...)
- ensure that mechanical equipment, air filters, water faucets, ventilation and hearing systems are checked and cleaned regularly and any problems or defects are reported promptly.”

2. To date, the board’s energy management strategy has included the following:

- Updating electrical, lighting, windows, doors, heating and cooling as part of ongoing project planning and renewal
- Utilizing control systems to minimize consumption
- Training and encouraging efficient use.

3. The Board has a Supervisor of Facility Services. The portfolio for this position includes energy management.

Energy Consumption Data for the Board

The values below are “metered” data for the Board. See Appendix D for details

Utility	Fiscal Year 2011-12 (Baseline)	Fiscal Year 2012-13 (Current)
Total Electricity (kWh)	3,414,361	3,698,639
Total Natural Gas (m3)	491,119	562,496
Total Propane (litres)	62,878	72,188

The values below are raw data.

	Fiscal Year 2011-12 (Baseline)	Fiscal Year 2012-13 (Current)
Total Energy Consumed (eKWh)	9,273,740	10,248,578
Energy Intensity (eKWh/m2)	184	204

Energy Conservation Goal

The Board has set out the following energy conservation goals for the next five fiscal years

Fiscal Year	2013-14 (ekWh/m2)	2014-15 (ekWh/m2)	2015-16 (ekWh/m2)	2016-17 (ekWh/m2)	2017-18 (ekWh/m2)
Conservation Goal	6.78	6.26	3.43	3.43	3.43
As a Percentage	3.3%	3.1%	1.7%	1.7%	1.7%

Fiscal Year 2013 to 2018 (ekWh/m2)	
Conservation Goal	79.52
As a Percentage	7.8%

Renewable Energy

The Board has:

Renewable Energy	Define	Number of systems in asset portfolio	Total size (kW)	Total number of ekWh generated annually	Actual or Estimated Generation (ekWh)
Solar photovoltaic	Board owned electrical power generation by converting solar radiation through solar panels on the roof at St. Anthony's, Kincardine. Solectria PVI 10KW. The system may be viewed at http://stanthonys.solarvu.net	one	10	11,924	11,924

Energy Management Strategies

Energy management strategies fall into three key categories:

1. Design/Construction/Retrofit

Definition

Design/construction/retrofit encompasses the original and ongoing intent of how a building and its systems are to perform as a whole through the integration of disciplines such as, architecture and engineering.

See Appendix A

2. Operations and Maintenance

Definition

Operations and maintenance includes the strategies the Board uses to ensure that the existing buildings and equipment perform at peak efficiency.

See Appendix B

3. Occupant Behaviour

Definition

Strategies that the Board uses to educate occupants, including staff, students and community users, with an emphasis in changing specific behaviours to reduce energy consumption.

See Appendix C

The details of the Board's energy management plan for the next five years is included the Appendix A, B and C.

4. **Environmental Programs**

1. In 2013-14, one school within the Board that participated in the EcoSchools environmental programs.

5. **Energy Efficient Incentives**

1. The Board applies to incentive programs to support the implementation of energy efficient projects on a regular basis.

If yes,

Between Fiscal Year 2009-10 and 2013-14, the Board has received \$ 60,726.60 in incentive funding from various agencies to support the implementation of energy efficient projects.

2. The Board uses the services of the sector's Incentive Program Advisor to assist with exploring opportunities.

6. **Energy Procurement**

1. The Board participates in the Catholic School Board Services Association (CSBSA) consortia arrangement to purchase electricity and natural gas.

7. **Demand Management**

1. The Board monitors electrical Demand monthly by reviewing invoices.
2. The Board uses the following methodologies to reduce electrical Demand by equipment scheduling.
3. The Local Distribution Companies (LDCs) for the Board do not state the Power Factor on each bill. The Board has not been monitoring the Power Factor in the past.

Approval of this Energy Conservation and Demand Management Plan

I confirm that the Bruce-Grey Catholic District School Board has reviewed and approved this Energy Conservation and Demand Management Plan.



Name: Cathy Colton

Job Title: Superintendent of Business

Dated: June 17, 2014

Appendix A

Design, Construction and Retrofit Strategies												
Lighting	Quantity of Time that Measure will be in place (years)	2013-14		2014-15		2015-16		2016-17		2017-18		2013/14-2017/18
		Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	
High Efficiency Lighting Systems (T-8, T-5, CFL, LED ...)	15	\$ 155,210	153,294	\$ 40,900	40,395	\$ 25,000	24,691	\$ 25,000	24,691	\$ 25,000	24,691	1,076,198
Daylight Sensors	10	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Outdoor Lighting	15	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Occupancy Sensors	10	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Daylight Harvesting	10	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Other (Describe)		\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
HVAC	Quantity of Time that Measure will be in place	2013-14		2014-15		2015-16		2016-17		2017-18		2013/14-2017/18
		Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	
Efficient Boilers (near condensing)	30	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
High Efficiency Boilers (condensing)	15	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
High-efficiency boiler burners	10	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Geothermal	15	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Heat recovery/enthalpy wheels	30	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Economizers	15	\$ 31,057	49,172	\$ 30,000	47,499	\$ -	-	\$ -	-	\$ -	-	435,858
Energy efficient HVAC systems	30	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Energy efficient Rooftop units	15	\$ 193,027	76,405	\$ 140,000	55,415	\$ 150,000	59,374	\$ 150,000	59,374	\$ 150,000	59,374	959,927
High Efficiency Domestic Hot Water	15	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Efficient Chillers and Controls	25	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
High-efficiency motors	20	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
VFD	15	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Demand Ventilation	10	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Entrance Heater Controls	20	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Other (Describe)		\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Controls	Quantity of Time that Measure will be in place	2013-14		2014-15		2015-16		2016-17		2017-18		2013/14-2017/18
		Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	
Building Automation Systems - New	10	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Building Automation Systems - Upgrade	10	\$ -	-	\$ 158,350	125,357	\$ 50,000	39,582	\$ 50,000	39,582	\$ 50,000	39,582	738,924
Other (Describe)		\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Building Envelope	Quantity of Time that Measure will be in place	2013-14		2014-15		2015-16		2016-17		2017-18		2013/14-2017/18
		Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	
Glazing	30	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Increased Wall Insulation	50	\$ -	-	\$ 80,000	37,216	\$ 75,000	34,890	\$ 75,000	34,890	\$ 75,000	34,890	358,206
New Roof	25	\$ 206,350	19,199	\$ 100,000	9,304	\$ 150,000	13,956	\$ 150,000	13,956	\$ 150,000	13,956	216,947
New Windows	30	\$ 152,808	35,543	\$ -	-	\$ -	-	\$ -	-	\$ -	-	177,717
Treatments	10	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Shading Devices	30	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Other (Describe)		\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Design, Construction and Retrofit Strategies Total		\$ 738,452	333,613	\$ 549,250	315,187	\$ 450,000	172,494	\$ 450,000	172,494	\$ 450,000	172,494	3,963,777

Appendix B

Operations and Maintenance Strategies

Policy and Planning	Quantity of Time that Measure will be in place (years)	2013-14		2014-15		2015-16		2016-17		2017-18		2013/14-2017/18
		Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Total Accumulated Energy Savings (ekWh)
New school design/construction guidelines and specifications	5	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Day and Night Temperature Guidelines for all Schools	10	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Night time blackout of sites	Interior	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
	Exterior	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Procures only Energy Star certified appliances	5	\$ 5,082	7,529	\$ -	-	\$ -	-	\$ -	-	\$ -	-	37,644
Daylight Harvesting (servicing)	3	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Demand Ventilation (servicing)	3	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Other (Describe)		\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Energy Audits	Quantity of Time that Measure will be in place	2013-14		2014-15		2015-16		2016-17		2017-18		2013/14-2017/18
		Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Total Accumulated Energy Savings (ekWh)
Walk Through Audit	5	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Engineering Audit	5	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Other (Describe)		\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Real Time Monitoring	Quantity of Time that Measure will be in place	2013-14		2014-15		2015-16		2016-17		2017-18		2013/14-2017/18
		Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Total Accumulated Energy Savings (ekWh)
Real-time energy data for operators to identify and diagnose building issues	5	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Other (Describe)		\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Operations and Maintenance Strategies Total		\$ 5,082	7,529	\$ -	-	\$ -	-	\$ -	-	\$ -	-	37,644

Appendix C

Occupant Behaviour Strategies												
Training and Education	Quantity of Time that Measure will be in place (years)	2013-14		2014-15		2015-16		2016-17		2017-18		2013/14-2017/18 Estimated Total Accumulated Energy Savings (ekWh)
		Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	
Building Operator Training	3	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
NRCan Benchmarking Program	5	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Building Automation Training (site specific)	3	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Ongoing training and awareness programs for energy conservation	5	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Provide detailed information on Building Operational costs	1	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Provide detailed information on energy consumption (e.g. via the Utility Consumption Database or other database)	1	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Participate in environmental programs, such as EcoSchools, Earthcare	1	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Other tools (Define)		\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Occupant Behaviour Strategies Total		\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-