Huron-Perth Catholic District School Board

Huron-Perth CDSB
Energy Conservation and Demand Management Plan
Update 2013-14 – 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 lists provide education sector 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
- Shared Use Sites (e.g. one building, two boards share common areas and/or partnered with a municipality)
    - Childcare
    - Libraries
    - Lighted sports fields

- 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: 19

Total Number of Students: 4114

Background

1. The Board has a qualitative energy conservation goal as specified in Board Policy 3E:15 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
- Ensure that air conditioners are not set lower than 10 degrees Celsius below outside temperature
- Consider the use of renewable sources of energy (i.e. solar/wind...)
- Ensure that mechanical equipment, air filters, water faucets, ventilation and heating 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 Plant Manager. The portfolio for this position includes energy management. The Board also utilizes the services of VIP Energy Inc. to procure energy and natural gas and to review utility billings on behalf of the Board.

Energy Consumption Data for the Board

The values below are "metered" data for the Board.

Utility	Fiscal Year 2011-12 (Baseline)	Fiscal Year 2012-13 (Current)
Total Electricity (KWh)	4,952,326	4,866,958
Total Natural Gas (m3)	548,454	615,627
Total Heating Fuel Oil Type 1 and 2 (L)	14,011	0

The values below are raw data.

	Fiscal Year 2011-12 (Baseline)	Fiscal Year 2012-13 (Current)
Total Energy Consumed (eKWH)	10,710,148	11,408,415
Energy Intensity (eKW/M2)	206	220

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	7.17	13.46	2.90	4.55	7.52
As a Percentage	3.0	6.0	1.0	2.0	3.0

	Fiscal year 2013 to 2018 (ekWh/m2)
Conservation Goal	115.01
As a Percentage	9.91

Renewable Energy

The Board has:

Renewal Energy	Define	Number of systems In 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 installed at St. Michael CSS and St. Anne's SS. The generated power runs the tools in the tech shop	2	4	4,000	4,000

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 in Appendix A, B and C.

4. Environmental Programs

1. In 2013-14, seventeen (17) schools within the Board participated in the Eco Schools 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 $56,980 in incentive funding from various agencies to support the implementation of energy efficient projects.

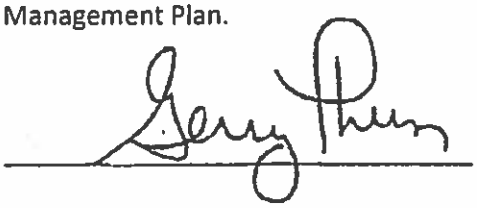
2. The Board uses the services of the sector's Incentive Program Advisor to explore opportunities.

6. **Energy Procurement**
   1. The Board uses VIP Energy Inc. to purchase electricity and natural gas.

7. **Demand Management**
   1. The Board monitors electrical Demand monthly be reviewing invoices.
   2. The Board uses equipment scheduling to reduce electrical Demand.
   3. Some of The Local Distribution Companies (LDCs) for the board state the Power Factor on each bill and others do not. 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 Huron-Perth CDSB has reviewed and approved this Energy Conservation and Demand Management Plan.



Dated July 1, 2014

Name: G. H. Thuss

Superintendent of Business and Treasurer

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)	Estimated Total Accumulated Energy Savings (ekWh)
High Efficiency Lighting Systems (T-8, T-5, CFL, LED ..)	15	$ -	-	$ 13,439	13,273	$ 21,500	21,235	$ -	-	$ 144,598	142,813	299,607
Daylight Sensors	10	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Outdoor Lighting	15	$ -	-	$ -	-	$ -	-	$ 29,200	28,840	$ -	-	57,679
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)	Estimated Total Accumulated Energy Savings (ekWh)
Efficient Boilers (near condensing)	30	$ 112,815	195,332	$ 252,402	437,017	$ -	-	$ -	-	$ -	-	2,724,727
High Efficiency Boilers (condensing)	15	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
High-efficiency boiler burners	10	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Geothermal	15	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Heat recovery/enthalpy wheels	30	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Economizers	15	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Energy efficient HVAC systems	30	$ 111,732	17,690	$ 759,834	120,304	$ 256,494	40,611	$ -	-	$ -	-	691,501
Energy efficient Rooftop units	15	$ 29,759	11,779	$ 10,809	4,278	$ -	-	$ -	-	$ 25,699	10,172	86,183
High Efficiency Domestic Hot Water	15	$ 28,697	58,973	$ -	-	$ -	-	$ -	-	$ -	-	294,865
Efficient Chillers and Controls	25	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
High-efficiency motors	20	$ -	-	$ -	-	$ -	-	$ -	-	$ 61,500	30,370	30,370
VFD	15	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Demand Ventilation	10	$ -	-	$ -	-	$ 10,001	23,752	$ -	-	$ -	-	71,255
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)	Estimated Total Accumulated Energy Savings (ekWh)
Building Automation Systems - New	10	$ -	-	$ 42,586	33,723	$ 26,689	21,128	$ -	-	$ -	-	198,237
Building Automation Systems - Upgrade	10	$ 16,376	12,964	$ 8,183	6,478	$ 8,101	6,413	$ 160,000	126,664	$ 155,604	123,184	486,483
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)	Estimated Total Accumulated Energy Savings (ekWh)
Glazing	30	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Increased Wall Insulation	50	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
New Roof	25	$ 226,794	21,101	$ 30,527	2,840	$ 114,990	10,699	$ 584,416	54,374	$ 838,542	78,018	315,730
New Windows	30	$ 257,596	59,917	$ 365,228	84,953	$ 92,483	21,512	$ 96,725	22,498	$ 20,000	4,652	753,580
Treatments	10	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Shading Devices	30	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Other (Describe)		$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-

Design, Construction and Retrofit Strategies Total	$ 785,769	327,757	$ 1,483,008	702,857	$ 530,258	145,349	$ 870,341	232,376	$ 1,245,944	389,210	5,990,219

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	10	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
	Exterior	10	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Procures only Energy Star certified appliances		5	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
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	$ -	-	$ 14,020	166	$ 10,216	121	$ -	-	$ -	-	1,030
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	$ -	-	$ 14,020	166	$ 10,216	121	$ -	-	$ -	-	1,030

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 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)
Building Operator Training	3	$ -	-	$ 500	1,766	$ 500	1,766	$ 500	1,766	$ 500	1,766	17,661
NRCan Benchmarking Program	5	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Building Automation Training (site specific)	3	$ -	-	$ 500	5,298	$ 500	5,298	$ 500	5,298	$ 500	5,298	52,983
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	$ 500	801	$ 500	801	$ 500	801	$ 500	801	$ 500	801	12,015
Other tools (Define)		$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Occupant Behaviour Strategies Total		$ 500	801	$ 1,500	7,865	$ 1,500	7,865	$ 1,500	7,865	$ 1,500	7,865	82,659