



**WINDSOR-ESSEX CATHOLIC
DISTRICT SCHOOL BOARD**
FACILITIES SERVICES DEPARTMENT

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Windsor-Essex Catholic District School Board
Energy Conservation and Demand Management Plan
July 1, 2014

Table of Contents

1. Education Sector Background.....	3
a. Funding and Energy Management Planning	3
b. Asset Portfolios and Energy Management Planning.....	3
i. Facility Variables	3
ii. Other Variables.....	3
2. About the Board	4
3. Background	4
4. Energy Consumption Data for the Board	5
5. Energy Conservation Goal	5
6. Renewable Energy	6
7. Energy Management Strategies	6
a. Design /- Construction / Retrofit	6
b. Operations and Maintenance	6
c. Occupant Behaviour	7
8. Environmental Programs	8
9. Energy Efficient Incentives	8
10. Energy Procurement	8
11. Demand Management	8
12. Senior Management Approval	8

Appendices

- Appendix A: Energy Conservation Goals
- Appendix B: Administrative Procedure PR SC: 19 Environmental Education
- Appendix C: Summary of Environmental Initiatives
- Appendix D: Design, Construction, and Retrofit Strategies
- Appendix E: Operation and Maintenance Strategies
- Appendix F: Occupant Behaviour Strategies
- Appendix G: Conservation Goal

1. Education Sector Background

a. Funding and Energy Management Planning

The Windsor-Essex Catholic District School Board (the Board) receives virtually all of its operational and capital funding from the Ministry of Education.

The Ministry announces the 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.

As a result, while the Board has a five-year energy management strategy, the Board's ability to implement the strategy is dependent on the funding received in each of the five years covered by the energy management plan.

The Board's focus on environmental education is to increase student knowledge and develop skills and perspectives that foster environmental stewardship of God's creation.

b. Asset Portfolios and Energy Management Planning

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

i. 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 (e.g. one building, two boards share common areas and/or partnered with a municipality)
 - Swimming pools
 - Libraries
 - Lighted sports fields
 - Enclosed sports domes
- Equipment/Systems
 - Age
 - Type of technology
 - Lifecycle
 - % air conditioned building area

ii. 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

2. About the Board

The following statistics apply to the Board's Fiscal Year 2012-13:

Total Number of Sites: 54

Total Number of Students: 21,048

3. Background

1. The Board's qualitative energy conservation goals are in **Appendix A**.
2. To date the Board's energy management strategy has included the Administrative Procedure PR SC: 19 Environmental Education in **Appendix B**. Also, the Board was allocated Energy Efficiency funding of \$4,059,244 over a two year period (2009-10, 2010-11). These funds were directed to be used to create environmentally friendly learning spaces to reduce energy use and to reduce greenhouse gas emissions. The Board used these funds for the following projects:
 - Energy Audits at two secondary schools;
 - Replacement of boilers at one elementary school;
 - Heating / Cooling System at one secondary school;
 - Installation of occupancy sensors at several facilities;
 - Installation of LED exit lighting at several facilities;
 - Installation of portable controls and unit ventilators at several schools;
 - Replacement of hot water tanks with energy efficient tanks at several schools.

The Board has installed two (2) 10kW Solar PV Micro-Fit System Installations one (1) at St. Pius X and one (1) at L.A. Desmarais.

A solar domestic hot water system was installed at St. Thomas of Villanova.

The Board continues to utilize energy efficient products and systems when conducting routine maintenance and in construction projects.

The schools within the Board implement different initiatives focusing on the environment to manage energy and waste. A summary of these initiatives are found in **Appendix C**. In addition to the summary of initiatives, St. Anne High School offers a specialized program SHSM (Specialist High Skills Major) focusing on educating student for energy related fields of work.

3. The Board has an energy management position.

The Board's energy management activities are within the portfolio of the Technical Supervisor - Facility Services. The Technical Supervisor will lead the environmental and energy initiatives for the

Board. The Technical Supervisor will initiate a plan to meet requirements of regulatory bodies and outline the Board's overall environmental and energy policy framework. The Technical Supervisor will assist the Board to leverage incentive programs for school environmental activities and installation or retrofit for energy efficient equipment.

In addition to energy management, the Technical Supervisor is involved in asset preservation, capital planning, maintenance management, and fleet management.

4. Energy Consumption Data for the Board

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

Utility	Sept. 2011 – Aug. 2012 (Baseline)	Sept. 2012 – Aug. 2013 (Current)
Total Electricity (kWh)	23,096,556	22,512,508
Total Natural Gas (m3)	2,787,223.64	3,422,735.66

The values below are raw data.

	Sept. 2011 – Aug. 2012 (Baseline)	Sept. 2012 – Aug. 2013 (Current)
Total Energy Consumed (ekWh)	51,860,704	57,835,140
Energy Intensity (ekWh/m2)	186.77	208.39

5. 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	1.93	2.36	4.35	2.88	2.18

	FY 2013-14 to 2017-18 (ekWh/m2)
Cumulative Conservation Goal	40.06

6. Renewable Energy

The Board has two (2) 10kW Solar PV Micro-Fit System Installations; one (1) at St. Pius X and one (1) at L.A. Desmarais. Each site has a hydro meter on the Solar PV system. The combined generation of the two sites is approximately 58,200 kWh for the 2012/13 fiscal year. The consumption can be viewed from an online portal.

7. Energy Management Strategies

Energy management strategies fall into three key categories:

- a. Design/construction/retrofit
- b. Operations and maintenance
- c. Occupant Behaviour

a. 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.

The Board's relevant projects over the next five years are provided in Appendix **D**.

Lighting

The Technical Supervisor will evaluate and select lighting conservation technologies that could produce a marked reduction in electrical consumption such as: LED lighting, efficient transformers, occupancy sensors, and daylight harvesting.

HVAC

The replacement of existing or purchase of new mechanical equipment shall be high-efficiency. This will include boilers, economizers, hot water, demand ventilation, etc.

Controls

The Board shall review the Building Automation Systems to match building occupancy related to temperature set-points to minimize energy consumption.

Building Envelope

The buildings' elements (roof, windows, doors, etc) shall be replaced with high efficiency product to reduce energy consumption when they have reached the end of their useful life.

b. 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. The Board's relevant projects over the next five years are provided in **Appendix E**.

Policy and Planning

The Facility Services Department will develop an environmental policy for the construction of new schools or renovations to existing schools.

A lighting policy will be developed for outside and inside lights during school hours and non-school hours.

The general operation and maintenance of all HVAC (heating, ventilation, and air conditioning) equipment shall be monitored and follow the Board's policy for operation.

Energy Audits

Subject to budgetary constraints, a plan to conduct energy audits will be developed. The results of the energy audits will be utilized to implement energy conservation measures.

Real Time Monitoring

Grants will be researched for the implementation of real time energy monitoring. If an acceptable grant is found, a school that has been identified as a high energy consumer will be selected for execution.

c. 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. The Board's relevant projects over the next five years are provided in **Appendix F**. A description of these projects is listed below:

Training and Education

The Facility Services Department will create an information document for principals, vice-principals and custodians to become familiar with their building envelope and best practices to reduce energy and maintain student and teacher comfort.

A benchmarking program will be developed to compare operations and systems to best-in-class operations. This will be used to identify areas for improvement and assist in developing a priority list of energy conservation measures.

The Technical Supervisor will continue to research energy conservation incentive programs best suited for the Board.

The Technical Supervisor will utilize the Utility Consumption Database to review the electrical and natural gas consumption at the Board's facilities and provide a summary report on an annual basis. The 2011 Energy Consumption and Greenhouse Gas Emissions summary is posted on the Board's website.

EcoSchools Energy Conservation

The board will expand the participation of EcoSchools. Once a school is selected to participate the implementation plan will be as follows:

- Provide information to the principals, vice-principals, and teachers about the EcoSchools program.
- Identify teachers that are interested in being an EcoSchool champion for their school.
- Select the teachers and schools to participate in the EcoSchool certification.
- Create an EcoSchool team consisting of teachers, principal or vice-principal, students, support staff, parents and the custodian.
- An Energy Conservation EcoReview is conducted in the selected schools as per the EcoSchools Energy Conservation guide.
- Develop an action plan from the EcoReview. This will identify priorities for the schools actions and strategies.

- Implement the action plan. Apply and utilize funding when possible to implement energy reducing strategies. Develop a communication system (main school display board, school website, etc).
- Monitor and evaluate progress to determine if targets have been achieved.
- Celebrate success through P.A. Announcements, awarding certificates, prizes, etc.

8. Environmental Programs

In 2012-13 St. Gregory and St. Christopher each participated in the EcoSchools Energy Conservation Program. Their environmental initiatives resulted in Silver Status certification.

9. Energy Efficient Incentives

The Board applies to incentive programs to support the implementation of energy efficient projects.

Between Fiscal Year 2009-10 and 2011-12, the Board has received funding from the Ministry to support the implementation of energy efficient projects.

The Board has started to use the services of the sector's Incentive Program Advisor to support its energy management planning.

10. Energy Procurement

The Board does not participate in a consortia arrangement to purchase electricity.

The Board participates in a natural gas consortium, with other local public sector entities including the Greater Essex County District School Board and the City of Windsor. Shell Energy North America Canada (Inc.) is the current marketer of the Board.


11. Demand Management

Currently, the Board does not monitor electrical Demand. The Technical Supervisor will develop a policy to monitor and reduce the electrical demand.

Some of the Local Distribution Companies (LDCs) for the Board explicitly state the Power Factor on each bill. Hydro One explicitly states the Power Factor on each bill. EnWin, E.L.K. Energy, and Essex PowerLines do not explicitly state the Power Factor on each bill.

12. Senior Management Approval of this Energy Conservation and Demand Management Plan

I confirm that the Windsor-Essex Catholic District School Board's senior management has reviewed and approved this Energy Conservation and Demand Management Plan.



 Mario Latonna
 Executive Superintendent of Corporate Services

June 19, 2014

 Date



APPENDIX A: Energy Conservation Goals

Objectives:

To increase student knowledge and develop skills and perspectives that foster environmental stewardship of God's creation.

To provide a safe and comfortable workplace and learning environment while reducing energy costs and the overall operating costs of the Board.

Guidelines:

The Board will comply with the applicable legal regulations related to the environment and environmental reporting.

The Board will continually to seek out new technologies to further reduce energy consumption in Board facilities and activities.

The Board will expand the use of environmentally friendly products in all facets of the Board's operations.

The Board will continue to utilize UCD (Utility Consumption Database) to monitor energy usage and yearly review and revise the energy objectives and targets.

The Board will provide training and education to staff and students to implement the energy conservation goals.

The Board will provide regular updates on the status of the goals and objectives.




WINDSOR-ESSEX CATHOLIC
DISTRICT SCHOOL BOARD

Appendix B

Administrative Procedure: PR SC: 19 Environmental Education

Windsor-Essex Catholic District School Board



Section: Schools

**ADMINISTRATIVE PROCEDURE:
PR SC: 19 Environmental
Education**

NUMBER:	PR SC: 19
EFFECTIVE:	July 27, 2010
AMENDED:	
RELATED POLICIES:	See References
REPEALS:	
REVIEW DATE:	2014 - 2015

1.0 OBJECTIVE:

- 1.1 The purpose of this administrative procedure is to support the requirements of the Board’s Environmental Education Policy.

2.0 GUIDELINES:

- 2.1 **Environmental education** is education about the environment, for the environment, and in the environment that promotes an understanding of rich and active experience in, and an appreciation for the dynamic interactions of:

- The Earth’s physical and biological systems
- The dependency of our social and economic systems on these natural systems
- The scientific and human dimensions of environmental issues
- The positive and negative consequences, both intended and unintended, of the interactions between human-created and natural systems.

To this end, the Board undertakes the following actions as standard practices generally categorized under Catholic Teaching and Learning; Student Engagement and Community Connections; and, Environmental Leadership.

2.2 Catholic Teaching and Learning

To increase student knowledge and develop skills and perspectives that foster environmental stewardship of God’s creation, the Windsor-Essex Catholic District School Board shall:

- i. Develop and maintain curriculum materials which invite students to discover that they are deeply related to the ecological and social system of our planet and that their concern for the fate of the earth is inherently a sacred concern. The connections among environmental issues, social justice concerns, consumerism and individualism will be recognized in curriculum.
- ii. Ensure that all environmental education and practice are incorporated into the context and methodology of the instructional program in all divisions and subject areas, as appropriate, through the use of relevant curriculum resource documents.
- iii. Support staff and students in linking environmental knowledge and related skills and activities to the teachings of diverse communities, including First Nations, Métis, and Inuit peoples, and to principles of responsible citizenship.

- iv. Encourage schools to provide opportunities for students to acquire knowledge and skills related to environmental education in all subject areas.
- v. Deepen students' connection to the natural world by expanding innovative interdisciplinary, experiential programs focussing on the environment.
- vi. Promote environmental leadership and provide encouragement for community-based, system-based, and school-based programs, projects, and special events designed to enhance environmental awareness and action in regard to local and regional environmental issues.
- vii Support schools in modeling and teaching environmental education through an integrated approach that promotes collaboration in the development of resources and activities.
- vii Schools will provide opportunities for students to acquire knowledge and skills related to environmental education in all subject areas, and encourage them to apply their knowledge and skills to environmental issues (e.g., loss of biodiversity, climate change, waste reduction, and energy conservation) through action-based projects.
- ix. Schools will develop learning opportunities that will help students understand underlying causes, the multiple dimensions, and the dynamic nature of environmental issues.
- x. Students will be challenged to develop skills in systems thinking and futures thinking that they will need to become discerning, active citizens who are actively aware of their responsibilities toward environmental protection and stewardship of God's creation.

2.3 Student Engagement and Community Connections

To increase student engagement by fostering active participation in environmental projects and building links between schools and communities, the Board will:

- i. Engage student leaders in the design and delivery of environmental education projects at the Board and school level.
- ii. Support students on a system-wide basis, as they develop skills and act as decision-makers to effect positive environmental change.
- iii. Share school and student projects across the Board that demonstrate engagement in environmental stewardship (e.g., science fair).
- iv. Encourage Catholic School Councils to provide advice on the implementation of environmental education and to work with the larger educational community to promote environmental awareness and foster appropriate environmentally responsible practices.
- v. In working with community partners to help extend engagement in and responsibility for environmental education to the broader community, share information about local resources that support environmental awareness and protection, energy conservation, waste management, protection of the biosphere, and outdoor education.

At the school level, students will be encouraged to enrich their learning, by:

- vi. Using information technology to access resources, connect with others, and create communities that focus on environmental issues.
- vii Addressing environmental issues in their homes, in their local communities, or at the global level.
- vii For secondary students, considering ways of completing their community service requirements that involve addressing environmental issues in their communities, in a manner consistent with Board policy.
- ix. Encouraging students to plan and participate in environmental education activities.

2.4 Environmental Leadership

The Board will promote leadership and encouragement for community-based, system-based, and school-based programs, projects, and special events designed to promote environmental awareness and conservation. In order to enhance the extent to which environmental education is integrated into Board policies, procedures, and strategic plan, the Board will:

- i. Encourage staff to act as exemplar role models and endeavour to create climates in which positive environmental action has an increased value and a priority status within the classroom, school, on Board property and in the community.
- ii. Create a system-wide Environmental Education Committee who will develop and annually review, a system-level Environmental Plan.
- iii. Embed environmental education as a priority in the Board's long-term System Priorities and annual strategic planning.
- iv. Develop and implement a plan for integrating sustainable environmental practices into the Board's operational services and similarly support schools in adopting environmentally responsible management practices that are consistent with Board policy.
- v. Implement strategies, programs, and procedures to protect and conserve the environment, while ensuring that schools and workplace environments are safe and healthy.
- vi. Develop environmentally responsible purchasing practices, while considering quality, price and service.
- vii Encourage all stakeholders to adopt and promote environmentally appropriate practices.
- vii Integrate in-service opportunities related to environmental education into staff development for all employee groups, in order to increase the capacity of staff to implement evidence-based environmental education programming, practices, and operations.

Schools will develop, using the Windsor-Essex Catholic District School Board Environmental Education Policy and the Board's Environmental Plan, local priorities focused on environmental education. Schools will encourage staff to develop knowledge and skills related to environmental education and responsible environmental practices as

well as encourage mentoring opportunities and sharing opportunities through existing networks.

2.5 Environmental Plan

- i. The Environmental Education Committee will develop and annually review, a system-level Environmental Plan that will be communicated to stakeholders.
- ii. The Environmental Plan will include specific goals, the strategies and actions required by the Board and schools to attain these goals, and a means of measuring progress towards achieving the annual goals.

The goals of the Environmental Plan will include, but are not restricted to:

- A. Goal 1: As stewards of God’s creation, by the end of Grade 12, students will acquire knowledge, skills, and perspectives that foster understanding of their fundamental connections to each other, to the world around them, and to all living things.
- B. Goal 2: Increase student engagement by fostering active participation in environmental projects and building links between schools and communities.
- C. Goal 3: Increase the capacity of system leaders to implement evidence-based environmental education programming, practices and operations.

3.0 REFERENCES:

Education Act, R.S.O. 1990 and its Regulations

Environmental Protection Act, R.S.O. 1990 and its Regulations

Acting Today, Shaping Tomorrow: A Policy Framework for Environmental Education in Ontario Schools (*Ministry of Education, 2009*)

Shaping Our Schools, Shaping Our Future - Environmental Education in Ontario Schools (*Report of the Working Group on the Environmental Education, Ministry of Education, 2007*)

Board Policy SC:19 Environmental Education



Appendix C: Summary of Environmental Initiatives at Elementary and Secondary Schools

- **Cleanup Projects**
 - Beach Cleanup (Point Pelee)
 - Clean Up Days – Keeping school yard clean
 - Creek Cleanup
 - Erie Shores Environmental Clean-up
 - Little River Cleanup
 - Neighbourhood Clean Ups
 - Rose City Clean-Up
 - Water Tributary Cleanup – Ojibway
 - Watershed Protection – River Canard Cleanup
- **Environment**
 - Bird Feeders
 - Butterfly Monitoring
 - Community Garden
 - Community Leaf Raking
 - Composting
 - ERCA Green Space Project
 - Gardening
 - Re-naturalized Grassland Area
 - School Grounds – Water Runoff Management Program
 - Sunflower Growing Contests
 - Vegetable Decorating & Growing Contest
- **Facilities**
 - Energy - turn lights off when not in room
 - New Energy saving Copiers
 - Outdoor classroom
 - Waste Management
- **Incentive Programs**
 - Green Apple Program – Metro
 - Greening our school yard – Pepsi Challenge
 - Personal Sustainability Program with Wal-Mart
 - Water Testing Kits – TD Canada Trust
- **Reduce, Reuse, Recycle**
 - Can Crushing
 - Electronics – paperless newsletters via web site
 - Ink Toner Cartridge Recycling
 - Juice jammers recycling
 - Old flyers for late slips and printing draft copies
 - Paper Conservation – limited # of photocopies
 - Paper shredding
 - Paperless Projects – class/school websites, newsletters, calendars on-line, greater use of Smart boards
 - Recycle Team
 - Tetra Pouch recycling
 - Used Batteries and Computer parts.
 - Used clothes
- **School Programs**
 - Costa Rica Enviro Research Station
 - EcoSchools
 - Enviro Works Products tested – display results in a Science Fair Format.
 - Environmental Job Opportunities Field Trip
 - Garbage-less Lunches
 - Green Team/Student Involvement
 - SHSM Energy: Specialist High Skills Major Energy
 - U. of W. Landscape green home project
 - Water Festival
- **Tree Planting**
 - Ambassadors Club
 - Creation of an ERCA Nature Centre
 - Developed back of school yard into conservation area
 - Native Tree Farm (over 300 trees)
 - Native Tree Nut Collection Program
 - Outdoor Classroom (ERCA project)
 - School Beautification/Environmental Serenity Garden Project

APPENDIX D: 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	\$ -	-	\$ -	-	\$ -	-	\$ 5,000	4,762	\$ 5,000	4,762	14,286
Daylight Sensors	10	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Outdoor Lighting	15	\$ -	-	\$ 25,000	23,810	\$ -	-	\$ 10,000	9,524	\$ 7,500	7,143	121,429
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	\$ 223,542	384,552	\$ 250,000	430,066	\$ 600,000	1,032,158	\$ 325,000	559,086	\$ 225,000	387,059	8,244,728
High Efficiency Boilers (condensing)	15	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
High-efficiency boiler burners	10	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Geothermal	15	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Heat recovery/enthalpy wheels	30	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Economizers	15	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Energy efficient HVAC systems	30	\$ 85,662	13,172	\$ 580,000	89,184	\$ 175,000	26,909	\$ 225,000	34,597	\$ 120,000	18,452	590,966
Energy efficient Rooftop units	15	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
High Efficiency Domestic Hot Water	15	\$ -	-	\$ -	-	\$ -	-	\$ 25,000	33,731	\$ 20,000	26,984	94,445
High Efficiency Domestic Water Plumbing Pumps	15	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Efficient Chillers and Controls	25	\$ -	-	\$ 40,000	2,857	\$ -	-	\$ 125,000	8,929	\$ 155,000	11,071	40,357
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)	Estimated Total Accumulated Energy Savings (ekWh)
Building Automation Systems - New	10	\$ -	-	\$ -	-	\$ -	-	\$ 25,000	19,221	\$ 25,000	19,221	57,662
Building Automation Systems - Upgrade	10	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
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	\$ 987,200	90,172	\$ 1,064,292	97,213	\$ 1,300,000	118,743	\$ 900,000	82,207	\$ 1,150,000	105,042	1,465,397
New Windows	30	\$ 209,458	47,830	\$ 5,000	1,142	\$ 100,000	22,835	\$ 75,000	17,126	\$ 110,000	25,119	371,595
Treatments	10	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Shading Devices	30	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Other (Describe)		\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Design, Construction and Retrofit Strategies Total		\$ 1,505,862	535,726	\$ 1,964,292	644,271	\$ 2,175,000	1,200,645	\$ 1,715,000	769,181	\$ 1,817,500	604,853	11,000,865

APPENDIX E: 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	\$ -	-	\$ 1,000	1,764	\$ -	-	\$ -	-	\$ -	-	7,057
Day and Night Temperature Guidelines for all Schools	10	\$ -	-	\$ -	-	\$ 1,500	3,460	\$ -	-	\$ -	-	10,379
Night time blackout of sites	Interior	\$ -	-	\$ -	-	\$ 500	824	\$ -	-	\$ -	-	2,471
	Exterior	\$ -	-	\$ -	-	\$ 500	824	\$ -	-	\$ -	-	2,471
Procures only Energy Star certified appliances	5	\$ -	-	\$ -	-	\$ -	-	\$ 1,000	2,306	\$ -	-	4,613
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	\$ -	-	\$ -	-	\$ 10,000	115	\$ -	-	\$ 10,000	115	461
Engineering Audit	5	\$ -	-	\$ -	-	\$ 15,000	173	\$ -	-	\$ 15,000	173	692
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	\$ -	-	\$ -	-	\$ -	-	\$ 25,000	21,064	\$ -	-	42,128
Other (Describe)		\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Operations and Maintenance Strategies Total		\$ -	-	\$ 1,000	1,764	\$ 27,500	5,395	\$ 26,000	23,371	\$ 25,000	288	70,273

APPENDIX F: 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	5	\$ -	-	\$ 500	1,027	\$ -	-	\$ 500	1,027	\$ -	-	6,162
NRCan Benchmarking Program	5	\$ -	-	\$ 1,500	17	\$ -	-	\$ 1,000	12	\$ -	-	92
Building Automation Training (site specific)	5	\$ -	-	\$ 2,000	4,108	\$ -	-	\$ 1,500	3,081	\$ -	-	22,594
Ongoing training and awareness programs for energy conservation	5	\$ -	-	\$ 500	387	\$ -	-	\$ 1,000	773	\$ -	-	3,093
Provide detailed information on Building Operational costs	5	\$ -	-	\$ 1,000	12	\$ -	-	\$ 500	6	\$ -	-	58
Provide detailed information on energy consumption (e.g. via the Utility Consumption Database or other database)	5	\$ -	-	\$ 500	6	\$ -	-	\$ 500	6	\$ -	-	35
Participate in environmental programs, such as EcoSchools, Earthcare	10	\$ -	-	\$ 1,500	2,647	\$ -	-	\$ 1,500	2,647	\$ -	-	15,879
Other tools (Define)		\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Occupant Behaviour Strategies Total		\$ -	-	\$ 7,500	8,203	\$ -	-	\$ 6,500	7,551	\$ -	-	47,913

APPENDIX G: Conservation Goal

	FY2013
Total Building Area (includes portables) (m²)	277,544
Total Building Area (includes portables) (ft²)	2,987,557
Energy Consumption for the board (ekWh)	57,835,140

	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)
Appendix B; Design, Construction and Retrofit Strategies Total	\$ 1,505,862	535,726	\$ 1,964,292	644,271	\$ 2,175,000	1,200,645	\$ 1,715,000	769,181	\$ 1,817,500	604,853	11,000,865
Appendix C; Operations and Maintenance Strategies Total	\$ -	0	\$ 1,000	1,764	\$ 27,500	5,395	\$ 26,000	23,371	\$ 25,000	288	70,273
Appendix D; Occupant Behaviour Strategies Total	\$ -	0	\$ 7,500	8,203	\$ -	0	\$ 6,500	7,551	\$ -	0	47,913
TOTAL	\$ 1,505,862	535,726	\$ 1,972,792	654,238	\$ 2,202,500	1,206,041	\$ 1,747,500	800,103	\$ 1,842,500	605,141	11,119,051
Percentage reduction		0.93		1.13		2.09		1.38		1.05	3.845084785
Conservation Goal (ekWh/m²)		1.93		2.36		4.35		2.88		2.18	40.06
Conservation Goal (ekWh/ft²)		0.179318958		0.218987792		0.40368806		0.267811766		0.202553949	3.72178762