



DISTRICT SCHOOL BOARD ONTARIO NORTH EAST



Energy Conservation and Demand Management Plan

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DSBONE Energy Environmental Committee Members

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Kristen Niemi

Ted Marcotte

Clinton Johanson

Norm Belanger

David Boutin

Dennis Draves

Andreanne Denis

Sean Robertson

Shawn Donovan

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Noel Cheeseman (Jupiter Energy Advisors)

Preface

Environmental concerns and the need to be globally competitive are providing a driving force for local industry to change the way energy use and energy costs are viewed. Rather than being an inevitable cost of doing business, energy is now considered to be a manageable input to the process, much like any raw material or other resource cost.

The first step in managing energy costs is creating an energy management plan. This document contains a template that lays out a logical format for capturing information critical to energy management planning. It formalizes the thought process involved in understanding the relative magnitude of energy costs, the possible ways to reduce energy use, energy targets that are likely to be achievable, and other associated activities that need to occur. While stand-alone energy management projects are satisfying to complete, the energy management plan provides the “big picture” view as an ongoing framework for optimizing overall energy use and achieving success.

Purpose

This report reviews all related energy management processes and assesses adequate planning and communication strategies and opportunities supporting the reduction of energy demand and consumption for District School Board Ontario North East (referred to as the “Board” in this report).

Commitment Statement

District School Board Ontario North East is committed to promoting a culture of energy conservation, efficiency through sustainable and innovative practices and stewardship.

Energy Management Goals and Objectives

District School Board Ontario North East is committed to putting their current Strategic Plan into action. The three priorities of culture, innovation and equity will align with energy goals and objectives. The Board will endeavor to:

- Reduce energy consumption through all available means
- Reduce operating costs associated with utility energy consumption
- Have champions to communicate the benefits of energy efficiency
- Collect and utilize information to manage energy use
- Have an energy management plan for the short and long terms
- Have a procurement policy that favours energy efficient equipment and materials
- Provide leadership on energy management through a dedicated committee
- Improve energy awareness in the overall school environment by effectively involving students and staff
- Enhance the classroom learning environment for students and staff (increased comfort conditions and improved lighting standards through maintenance and capital projects)
- Be an effective leader of energy awareness by showing and teaching the benefits of environmental awareness

Funding and Energy Management Planning

All school boards receive 100% of their funding from the Ministry of Education.

The Ministry announces each Board's funding allocation in March for the next school board 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 a Board may have a five-year energy management strategy, the Board's ability to implement their strategy is dependent on the funding that is received for each of the five years covered by their plan.

Facility Variables

There are numerous factors that influence a Board's ability to meet energy conservation goals. Facility Variables listed in **Appendix A** will significantly impact energy consumption.

PART I – ENERGY CONSERVATION AND DEMAND MANAGEMENT PLAN FOR FY 2018-19 TO FY 2022-23

Part I outlines the Board's plan to reduce energy consumption through energy management strategies including: Renewable Energy; Design/Construction/Retrofit; Operations and Maintenance; and Occupant Behaviour.

A. Energy Management Strategies

Renewable Energy

Renewable energy through solar panels, wind turbines etc. is a strategy to reduce a board's energy consumption from the province's electricity grid.

For a list of the Board's renewable energy projects being considered over the next five years, refer to **Appendix B**.

Note: There are currently no planned renewable energy strategies planned for the next five years. If capital funds become available, renewable energy strategies will be reviewed.

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.

For the Board's relevant projects over the next five years, refer to **Appendix C**.

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.

For the Board's relevant projects over the next five years, refer to **Appendix D**.

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.

For the Board's relevant projects over the next five years, refer to **Appendix E**

B. Future Energy Conservation Goals

The Board has set out the following energy intensity reduction conservation goals for the next five fiscal years as per **Appendix F**.

Annual Energy Intensity Conservation Goals

Annual Energy Intensity Conservation Goal	Fiscal Year				
	2018-19	2019-20	2020-21	2021-22	2022-23
ekW/ft2	1.02	0.31	0.93	0.43	0.21
% decrease	5.37	1.63	4.88	2.29	1.10

Cumulative Conservation Goal

The following charts indicates the Board's Cumulative Energy Intensity Conservation Goal and Total Energy Intensity Target for the next five fiscal years.

Cumulative Conservation Goal	FY 2018-19 to 2022-23
ekWh/ft2	2.90
Percentage (%) Decrease	15.26

Total Energy Intensity Target

Weather Normalized Values	Fiscal Year 2018-19 (Baseline Year)	Fiscal Year 2022-23
Energy Intensity (ekWh/ft2)	18.70	15.80

C. Environmental Programs

ENERGY ENVIRONMENTAL COMMITTEE

The Board's Energy Environmental Committee was established in line with the Board's policy on Environmental Education. The first task of the committee has been to contribute to the development of this plan.

The Energy Environmental Committee will be involved in activities like:

- participating in energy management planning, and development of the energy management plan
- increasing awareness and engagement across Board departments in energy/water management practices to reduce energy and water consumption
- developing strategies and supporting initiatives to integrate best energy and water management practices into daily operations
- ensuring that the appropriate resources are used in support of the ECDMP
- monitoring, evaluating and reporting on energy and water use performance across the Board portfolio

STUDENT ENGAGEMENT

Student participation in sustainable environmental practices is encouraged. The goal is to develop programs that empower students and develop their environmental consciousness. Education is the first step in this process, and is achieved by holding environmental awareness days at schools with workshops and guest speakers.

One of the Committee's activities is to empower students with environmental leadership positions.

Another activity of the Committee is to promote environmental education leaders who champion various environmental initiatives in their school. The environmental champion for each school could double as an energy champion as they work in tandem. These individuals have an impact on energy use for their facility and can identify any projects that could benefit their school by saving energy.

OPERATIONAL SAVINGS

Operational savings are typically achieved through non-capital improvements to control systems. Optimizing the operation of a system from an energy perspective can often produce significant and measurable savings while maintaining or improving the system reliability and throughput. Operational savings can be achieved by operator training on energy conservation.

System operators will often have ideas for optimizing their system and eliminating wasteful idling or other unnecessary run time. Communicating of energy saving ideas has always been encouraged throughout the Board.

An annual environmental report card showing electricity, natural gas, CO2 emissions and waste will be distributed to each school and the school that show their commitment to decrease their energy intensity would be rewarded.

Posters regarding Earth Hour are distributed to all schools across the Board in order to promote awareness on energy savings and the environment. A Board Earth Hour, where many of the lights in a facility are turned off for one designated hour, will be an operational savings. Implementation of this Earth Hour will be reviewed by Senior Administration.

As a best-practice, energy management training can modify building occupant behaviour. Committing to a comprehensive, ongoing training plan can empower staff to recognize the energy impact of their daily operations and change their behaviour, which will improve the efficiency and performance of the building.

Training provides a variety of benefits throughout the organization, including:

- increased staff and building occupant awareness
- enhanced knowledge and skills
- reduced energy and cost savings
- engaged staff and culture of energy savings
- extended building life
- reduced maintenance costs

D. Energy Efficiency Incentives

The Board applies to incentive programs to support the implementation of energy efficient projects on a regular basis. The Board uses the services of the sector's Incentive Program Advisor (IPA).

Between Fiscal Year 2013-14 and Fiscal Year 2017-18, the Board has received \$429,195 in incentive funding from various agencies to support the implementation of energy efficient projects.

A sample of these projects is shown below:

1. Union Gas (Embridge) \$142,279
Federal PS - Rooftop Unit
15 schools - Boiler Retrofits
2. Hydro One (IESO) - Save ON Energy \$286,916
KLDCS, THVS and TDSS - Voltage Harmonizers
14 schools - LED Lighting Retrofits

The Board's existing 100kw roof-top solar photovoltaic system at a high school in New Liskeard (TDSS) generates approximately 113,573 kWh of electricity annually at a rate of 54.8¢ per kWh. Between April 30, 2015 to April 30, 2019, the Board has received \$218,222.91 from this incentive.

E. Energy Procurement

The Board participates in a consortia to purchase electricity - OECM's Strategic Electricity Management and Advisory Services.

The Board has an authorized agent for the purchase of their natural gas supply. Target prices are established and new strategies are implemented if target prices are not met.

The Board's purchasing policy and procedures and environmental education policy require that it should have environmentally responsible purchasing practices, while considering quality, price and service.

F. Tracking and Reporting

BUILDING AUTOMATION SYSTEMS

The Board is taking advantage of building automation systems (BAS) in 21 of their facilities.

The Board uses equipment scheduling, phased/staged use of equipment and deferred start-up of large equipment (e.g.: chiller start-up in spring) to reduce electrical and natural gas demand.

UTILITY CONSUMPTION DATABASE

The Board uses the Utility Consumption Database (UCD) to monitor electrical and natural gas demand.

The UCD is built-up through billing information from the Local Distribution Company (LDC). The LCDs do not provide consolidated bills and except for one LCD, do not state the Power Factor on each bill.

The Board reviews the data such as electrical and natural gas consumption and energy intensity in the UCD twice a year and when required, to further improve monitoring and analysis of consumption data to support the Energy Management Plan.

G. Opportunity Identification and Analysis

BUILDING AUDITS

Through the use of walk-through assessments and engineering audits, major energy using equipment and systems will be identified.

The Building Supervisor will conduct a general energy assessment of a facility when performing annual cleaning audits.

Engineering Consultants will perform energy audits of the poorest performing schools to determine what can be done to improve energy performance.

RECOMMISSIONING

The Board intends to evaluate poorer performing schools as candidates for recommissioning. Recommissioning optimizes building operations by ensuring equipment and schedules are performing as required. It identifies areas for improvement including equipment is not functioning as specified and is one of the most economical methods to improve the performance of a building.

REAL-TIME DATA MONITORING

The Board is looking to pilot real-time data monitoring in the next five years. Monitoring is the key to identifying areas where consumption can be reduced, and significant cost savings can be had by controlling consumption at key times.

PART II – A REVIEW OF PROGRESS AND ACHIEVEMENTS IN THE PAST FIVE YEARS

A. The Board's Asset Portfolio

The following chart outlines the energy-related variables/metrics in the Board's asset portfolio that changed from the baseline year (FY 2012-13) to the end of the five-year reporting period (FY 2017-18).

	FY 2012-13 (Baseline)	FY 2017-18	Variance
Total Number of Buildings	41	42	1
Total Number of Portables/Portapaks	0	0	0
Total Floor Area	1,941,698 square feet	1,963,210 square feet	21,512 square feet
Average Operating Hours	47	47	47
Average Daily Enrolment	5,287	4,935	(352)

B. Energy Consumption Data for the Board

The chart below lists the "metered"¹ consumption values in the common unit of ekWh.

Utility	Fiscal Year 2012-13 (Baseline)	Fiscal Year 2017-18 (Current)
Total Electricity (kWh)	13,417,050	10,261,500
Total Natural Gas (ekWh)	33,591,010	27,012,850

NOTE TO THE READER

1. Metered (also known as "raw") consumption data does not take into consideration the impact of weather on energy usage and as a result it does not allow an accurate analysis of energy performance from one year to the next.

C. Weather Normalized Energy Consumption Values

In Ontario, 25-35% of energy consumption for a facility is impacted by weather. To put the impact of weather in context, the following chart shows the Weighted Average Heating Degree Days (HDD)² and Cooling Degree Days (CDD)³ for the six most common Environment Canada weather stations in the Ontario education sector.

¹ Metered consumption is the quantity of energy used and does not include a loss adjustment value (the quantity of energy lost in transmission).

² Heating Degree Day (HDD) is a measure used to quantify the impact of cold weather on energy use. In the data above, HDD are the number of degrees that a day's average temperature is below 18C (the balance point), the temperature at which most buildings need to be heated

³ Cooling Degree Day (CDD) is a measure used to quantify the impact of hot weather on energy use. In the data above, CDD are the number of degrees that a day's average temperature is above 18C, the temperature at which most buildings need to be cooled. It should be noted that not all buildings have air conditioning and some building have partial air conditioning. The UCD only applies CDD to meters that demonstrate an increase in consumption due to air conditioning.

Ontario Degree Days	Fiscal Year					
	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
HDD	3698	4285	4091	3355	3583	3989
CDD	289	217	271	462	303	432

NOTES TO THE READER

2. The balance point for calculating the above HDD and CDD values is 18C.
3. Boards have an energy management tool, the Utility Consumption Database (UCD), which calculates the balance point for each meter based on energy consumption patterns. The actual HDD and CDD values for each meter are based on the data from the closest Environment Canada weather station to the facility and are used to calculate weather normalized values.

The best way to compare energy consumption values from one year to another is to use weather normalized values as they take into consideration the impact of weather on energy performance and allows an “apple-to-apple” comparison of consumption across multiple years.

However a straight comparison of Total Energy Consumed between one or more years does not take into consideration changes in a board’s asset portfolio, such as Facility Variables listed in Appendix I which will significantly impact energy consumption.

As a result, weather normalized Energy Intensity⁴ is the most accurate measurement that allows the evaluation of a Board’s energy consumption from one year to another as it negates any change in floor areas.

Weather Normalized Values	Fiscal Year 2012-13 (Baseline Year)	Fiscal Year 2017-18 (most recent available data)
Total Energy Consumed (ekWh)	46,957,900	37,274,350
Energy Intensity (ekWh/ft2)	24.18	18.70

D. Review of Previous Energy Conservation Goals and Achievements

In 2014, the Board set annual energy conservation goals for the next five fiscal years. The following chart compares the Energy Intensity Conservation Goal with the Actual Energy Intensity Reduced for each year.

Fiscal Year	Conservation Goal		Actual Energy Savings	
	ekWh/ft2	%	ekWh/ft2	%
2013-14	0.58	2.4	1.35	5.6
2014-15	0.67	2.8	0.42	1.9
2015-16	0.80	3.4	1.97	8.8

⁴ Energy Intensity (EI) is the quantity of total energy consumed divided by the total floor area. EI is typically expressed as ekWh/ft2, GJ /m2 etc., depending on the user’s preference.

2016-17	0.90	3.9	1.05	5.2
2017-18	0.59	2.5	0.68	3.5

E. Cumulative Energy Conservation Goals

The chart below compares the 2014 Forecasted Cumulative Energy Intensity Conservation Goal with the Actual Cumulative Energy Intensity Reduced Savings.

		(ekWh/ft ²)	Variance %
2014 Board Plan	Forecasted Cumulative Energy Intensity Conservation Goal FY 2013-14 to FY 2017-18 source: Board's 2014 Plan	3.54	
	Forecasted Cumulative Energy Intensity Conservation Goal as a Percentage source: Board's 2014 Plan		14.7
FY 2017-18	Actual Cumulative Energy Intensity Reduced/Increased between FY 2013-14 to FY 2017-18 - weather normalized	5.48	
Variance	2014 Forecasted Cumulative Conservation Goal and Actual Cumulative Energy Intensity Reduced/Increased - weather normalized	1.94	
	% of Cumulative Energy Intensity Conservation Goal Achieved - weather normalized		155

F. Measures Implemented from FY 2012-13 to FY 2017-18

A list of the measures implemented, the associated costs, and the fiscal year that the measure was implemented within the Board are outlined in **Appendix G**. The Summary of Total Investments in Energy Management Strategies can be found in **Appendix H**.

IMPORTANT CONSIDERATION - It takes a minimum of one full year after an energy management strategy has been implemented before an evaluation can determine the associated actual energy savings achieved.

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

I confirm that District School Board Ontario North East's senior management has reviewed and approved this Energy Conservation and Demand Management Plan.



Lesleigh Dye
Director of Education
District School Board Ontario North East

June 21, 2019

Date

APPENDIX A

Asset Portfolios and Energy Management Planning

The education sector is unique in that a Board's asset portfolio can experience significant changes that significantly impact a board's energy consumption over a five-year period.

The following is a list of some of the most common variables and metrics that change in the education sector. These examples will play a significant role in the Board's assessment of energy management priorities.

Facility Variables

- Construction
 - Year built
 - Number of floors
 - Orientation of the building
 - Building envelope
- Building Area
 - Major additions
 - Sites sold/closed/demolished/leased
 - Portables
 - Installed
 - Removed
 - Areas under construction
- Equipment/Systems
 - Age
 - Type of technology
 - New technologies
 - Lifecycle
 - % air conditioned space
- Site Use
 - Elementary school
 - Secondary school
 - Administrative building
 - Maintenance/warehouse facility
 - Community Hubs
- Shared Use Sites (e.g. one building, two or more boards share common areas and/or partnered with a municipality)
 - Swimming pools
 - Libraries
 - Lighted sports fields
 - Enclosed sports domes

Other Variables

- Programs
 - Child care
 - Before/After School Programs
 - Summer School
 - Community Use
 - Outdoor ice rinks
- Occupancy
 - Significant increase or decrease in number of students
 - Significant increase in the hours of operation
 - New programs being added to a site
- Air Conditioning
 - Significant increase in air conditioned space
 - Portables
- Other
 - Location – transportation of utilities to remote areas
 - Weather conditions
 - Standard Operating Procedures (temperature schedules and settings)
 - Office equipment inventory (e.g. computers, copiers, printing machines)
 - Commercial Kitchen Equipment (eg. Dishwashers with boosters, exhaust fans)
 - Personal use of equipment (eg. heaters, fridges)
 - Operation of water fixtures
 - Water flushing activities
 - Changes in the Ontario Building Code

APPENDIX B

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					
Solar air					
Solar water					
Wind Turbine					
Biomass					
Other					

APPENDIX C

Design, Construction and Retrofit Strategies												
Lighting	Quantity of Time that Measure will be in place (years)	2018-19		2019-20		2020-21		2021-22		2022-23		2018/19-2022/23
		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	15	\$ 1,123,504	917,146	\$ 160,000	130,612	\$ 215,034	175,538	\$ 150,000	122,449	\$ 360,000	293,878	6,173,569
Outdoor Lighting	15	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Occupancy Sensors	10	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Other (Describe)		\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
HVAC	Quantity of Time that Measure will be in place	2018-19		2019-20		2020-21		2021-22		2022-23		2018/19-2022/23
		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	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
High Efficiency Boilers (condensing)	15	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
High-efficiency boiler burners	10	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Geothermal	20	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Heat recovery/enthalpy wheels	30	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Economizers	15	\$ 20,000	26,189	\$ -	-	\$ -	-	\$ -	-	\$ -	-	130,944
Energy efficient HVAC systems	30	\$ 281,947	36,919	\$ 420,049	55,003	\$ 4,017,800	526,105	\$ -	-	\$ -	-	1,982,922
Energy efficient Rooftop units	15	\$ 266,485	87,236	\$ -	-	\$ 93,563	30,629	\$ 21,481	7,032	\$ -	-	542,131
High Efficiency Domestic Hot Water	15	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Efficient Chillers and Controls	25	\$ 201,300	11,503	\$ -	-	\$ -	-	\$ -	-	\$ -	-	57,514
High-efficiency motors	20	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
VFD	15	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Demand Ventilation	10	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Entrance Heater Controls	20	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Destratification Fans	10	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Other (Describe)		\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Controls	Quantity of Time that Measure will be in place	2018-19		2019-20		2020-21		2021-22		2022-23		2018/19-2022/23
		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	\$ -	-	\$ 95,000	62,198	\$ 158,783	103,958	\$ -	-	\$ -	-	560,667
Building Automation Systems - Upgrade	10	\$ 254,498	166,624	\$ -	-	\$ -	-	\$ -	-	\$ -	-	833,122
Real-time energy data for operators to identify and diagnose building issues	10	\$ 80,000	261,887	\$ -	-	\$ -	-	\$ -	-	\$ -	-	1,309,436
Voltage Harmonizers	15	\$ 65,000	53,061	\$ -	-	\$ -	-	\$ -	-	\$ -	-	265,306
Other (Describe)		\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Building Envelope	Quantity of Time that Measure will be in place	2018-19		2019-20		2020-21		2021-22		2022-23		2018/19-2022/23
		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	\$ -	-	\$ 307,884	132,892	\$ 40,879	17,645	\$ -	-	\$ -	-	584,501
New Roof	25	\$ 2,170,812	187,397	\$ 673,339	58,127	\$ 1,694,364	146,268	\$ 5,484,385	473,445	\$ 1,218,664	105,202	2,660,389
New Windows	30	\$ 1,167,785	252,025	\$ 773,207	166,870	\$ 3,720,236	802,882	\$ 1,147,980	247,751	\$ 36,009	7,771	4,839,527
Treatments	10	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Shading Devices	30	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Other (Describe)		\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Design, Construction and Retrofit Strategies Total		\$ 5,631,331	1,999,989	\$ 2,429,479	605,701	\$ 9,940,659	1,803,025	\$ 6,803,846	850,677	\$ 1,614,673	406,851	19,940,029

APPENDIX D

Operations and Maintenance Strategies												
Policy and Planning	Quantity of Time that Measure will be in place (years)	2018-19		2019-20		2020-21		2021-22		2022-23		2018/19-2022/23
		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	10	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Interior	10	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Exterior	10	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Procures only Energy Star certified appliances	5	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Demand Ventilation (servicing)	3	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
HVAC optimization (coil cleaning, re-calibration of equipment)	3	\$ -	-	\$ 500	2,455	\$ 500	2,455	\$ 500	2,455	\$ 500	2,455	24,552
Commissioning (retro and re)	10	\$ -	-	\$ -	-	\$ 5,000	4,910	\$ -	-	\$ -	-	14,731
Other (Describe)		\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Energy Audits	Quantity of Time that Measure will be in place	2018-19		2019-20		2020-21		2021-22		2022-23		2018/19-2022/23
		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	\$ -	-	\$ -	-	\$ 500	5	\$ -	-	\$ -	-	15
Engineering Audit	5	\$ -	-	\$ -	-	\$ -	-	\$ 8,000	79	\$ -	-	157
Other (Describe)		\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Operations and Maintenance Strategies Total		\$ -	-	\$ 500	2,455	\$ 6,000	7,370	\$ 8,500	2,534	\$ 500	2,455	39,455

APPENDIX E

Occupant Behaviour Strategies												
Training and Education	Quantity of Time that Measure will be in place (years)	2018-19		2019-20		2020-21		2021-22		2022-23		2018/19-2022/23
		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	\$ -	-	\$ -	-	\$ 800	2,290	\$ -	-	\$ -	-	6,869
Energy Benchmarking Program	5	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Building Automation Training (site specific)	3	\$ -	-	\$ -	-	\$ 500	4,293	\$ -	-	\$ -	-	12,880
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	624	\$ -	-	\$ -	-	1,871
Other tools (Define)		\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	-
Occupant Behaviour Strategies Total		\$ -	-	\$ -	-	\$ 1,800	7,207	\$ -	-	\$ -	-	21,620

APPENDIX F
Conservation Goal

	FY 2017-2018
Total Building Area (includes portables) (ft ²)	1,963,210
Energy Consumption for the board (ekWh)	37,274,350

	2018-19		2019-20		2020-21		2021-22		2022-23		2018/19-2022/23
	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	\$ 5,631,331	1,999,989	\$ 2,429,479	605,701	\$ 9,940,659	1,803,025	\$ 6,803,846	850,677	\$ 1,614,673	406,851	19,940,029
Appendix C; Operations and Maintenance Strategies Total	\$ -	0	\$ 500	2,455	\$ 6,000	7,370	\$ 8,500	2,534	\$ 500	2,455	39,455
Appendix D; Occupant Behaviour Strategies Total	\$ -	0	\$ -	0	\$ 1,800	7,207	\$ -	0	\$ -	0	21,620
TOTAL	\$ 5,631,331	1,999,989	\$ 2,429,979	608,157	\$ 9,948,459	1,817,602	\$ 6,812,346	853,211	\$ 1,615,173	409,306	20,001,104
Percentage reduction		5.37		1.63		4.88		2.29		1.10	15.26
Conservation Goal (ekWh/ft ²)		1.02		0.31		0.93		0.43		0.21	2.90

APPENDIX G

Energy Conservation Projects 2013-2018					
YEAR	SCHOOL (ASSET)	PROJECT#	PROJECT (ELEMENT)	DETAILS (EVENT)	COST
2013-14	Federal Public School, Building ID 8864-1	7165	BUILDING ENVELOPE - New Roof	Replace Gym Roof	\$91,803
2013-14	Iroquois Falls PS, Building ID 5490-1	7163	HVAC - High Efficiency Boilers (condensing)	Replace Boilers with new Hydrotherms	\$266,950
2013-14	Iroquois Falls SS, Building ID 5006-1	7174	HVAC - Demand Ventilation	Terminal units (Herman Neilsons) - year 1	\$26,775
2013-14	Iroquois Falls SS, Building ID 5006-1	7162	BUILDING ENVELOPE - New Roof	Roof over Music Room and rest of 3rd floor	\$207,914
2013-14	Joseph H Kennedy PS, Building ID 6252-1	7171	BUILDING ENVELOPE - New Windows	replace windows on addition (15) for energy efficiency	\$48,875
2013-14	Kapuskasing DHS, Building ID 5007-1	7115	HVAC - Other (Describe)	Steam heating system design - year 1	\$16,636
2013-14	Kapuskasing DHS, Building ID 5007-1	7159	BUILDING ENVELOPE - New Roof	Replace roof over F Wing	\$265,075
2013-14	Kerns PS, Building ID 6097-1	7186	HVAC - High Efficiency Boilers	Electrical preparation work - year 1	\$18,679
2013-14	New Liskeard Public School - West Wing, Building ID 6347-2	7168	HVAC - Efficient Boilers (near condensing)	Boiler replacement - Weil-McLean	\$133,661
2013-14	Pinecrest PS, Building ID 6462-1	7169	HVAC - High Efficiency Boilers (condensing)	HYDROTHERM 750 MBH	\$139,643
2013-14	Pinecrest PS, Building ID 6462-1	7177	BUILDING ENVELOPE - New Windows	Exterior windows - East side	\$34,570
2013-14	R Ross Beattie Sr PS, Building ID 6557-1	7164	BUILDING ENVELOPE - New Roof	North and west side of building 2nd storey to curb	\$158,596
2013-14	Roland Michener SS, Building ID 8378-1	7160	BUILDING ENVELOPE - New Roof	Roof replacement - Large gym roof (front side)	\$300,151
2013-14	Roland Michener SS, Building ID 8378-1	7161	BUILDING ENVELOPE - Other (Describe)	Exterior caulking; masonry and precast repair -Replace precast panels that are cracked with granex - year 1	\$154,982
2013-14	Timiskaming Dist.SS, Building ID 8394-1	7166	HVAC - Demand Ventilation	Terminal units (Herman Neilsons) - year 1	\$58,259
2013-14	W Earle Miller PS, Building ID 6283-1	7167	HVAC - High Efficiency Boilers (condensing)	HYDROTHERM (6 boilers)	\$135,984
	TOTAL 2013-2014				\$2,058,553
2014-15	Bertha Shaw PS, Building ID 5413-1	7199	HVAC - High Efficiency Boilers (condensing)	HYDROTHERM	\$116,915
2014-15	Bertha Shaw PS, Building ID 5413-1	7224	BUILDING ENVELOPE - Glazing	Glass block wall at JK/K classroom	\$23,450
2014-15	Englehart HS, Building ID 8204-1	7201	HVAC - High Efficiency Boilers (condensing)	HYDROTHERM - one bank is 2003 and other is older	\$199,999
2014-15	Golden Avenue PS, Building ID 5900-1	7194	HVAC - High Efficiency Boilers (condensing)	HYDROTHERM	\$121,194
2014-15	Iroquois Falls SS, Building ID 5006-1	7239	HVAC - Demand Ventilation	Terminal units (Herman Neilsons) - continuation year 2	\$20,465
2014-15	Kerns PS, Building ID 6097-1	7186	HVAC - High Efficiency Boilers	continuation of outstanding 2013-14 work - year 2	\$21,608
2014-15	Kerns PS, Building ID 6097-1	7204	BUILDING ENVELOPE - New Roof	Partial roof replacement design - year 1	\$14,778
2014-15	Roland Michener SS, Building ID 8378-1	7228	LIGHTING - High Efficiency Lighting Systems (T-8, T-5, CFL, LED ...)	Relamp and reballast existing 32W T8 lamps and electronic ballasts to low wattage 28W T8 lamps and new generation electronic ballasts	\$16,380
2014-15	Roland Michener SS, Building ID 8378-1	7161	BUILDING ENVELOPE - Other (Describe)	Exterior caulking; masonry and precast repair -Replace precast panels that are cracked with granex - year 2	\$90,604
2014-15	Schumacher PS, Building ID 6647-1	7227	BUILDING ENVELOPE - New Windows	Replacement of basement windows	\$10,000
2014-15	Timiskaming Dist.SS, Building ID 8394-1	7166	HVAC - Demand Ventilation	Terminal units (Herman Neilsons) - continuation year 2	\$78,452
2014-15	Timiskaming Dist.SS, Building ID 8394-1	7193	HVAC - Efficient Boilers (condensing) and Domestic Hot Water	24 hydrotherms and Domestic Hot water boiler and tank to be replaced/chiller and boiler can be on the same lines	\$536,633
2014-15	Timiskaming Dist.SS, Building ID 8394-1	7202	HVAC - Energy efficient Rooftop units	Roof top air handling units	\$170,581
2014-15	Timiskaming Dist.SS, Building ID 8394-1	7203	BUILDING ENVELOPE - New Roof	roof replacement section over 208	\$135,225
2014-15	Timmins H & VS, Building ID 8406-1	7219	LIGHTING - High Efficiency Lighting Systems (T-8, T-5, CFL, LED ...)	Replacement Lighting Equipment - Original Building]	\$46,472
2014-15	Various Schools Timmins H & VS, Building ID 8406-1 Roland Michener SS, Building ID 8378-1 Kapuskasing DHS, Building ID 5007-1 Golden Avenue PS, Building ID 5900-1	7232 7233 7234 7235	CONTROLS - Other (Describe)	EBI BAS upgrade - Upgrade panels and points +/- \$12,000 per panel x 6 locations - year 1	\$255,099
	TOTAL 2014-2015				\$1,857,855
2015-16	Central Public School, Building ID 8865-1	7268	HVAC - High Efficiency Boilers	2x900MBH - not high efficiency	\$164,567
2015-16	Cochrane HS, E.s., Building ID 5004-1	7246	LIGHTING - High Efficiency Lighting Systems (T-8, T-5, CFL, LED ...)	Redesign HID lighting with T5 fluorescents	\$19,500
2015-16	Cochrane HS, E.s., Building ID 5004-1	5152	BUILDING ENVELOPE - Other (Describe)	Major Repair Exterior Walls - Headall Repair - Original Building]	\$32,814
2015-16	Elk Lake PS, Building ID 6059-1	7209	BUILDING ENVELOPE - New roof	Replace roofing - year 1	\$252,153
2015-16	Englehart HS, Building ID 8204-1	7275	BUILDING ENVELOPE - Other (Describe)	exterior wall repairs	\$71,650
2015-16	Federal Public School, Building ID 8864-1	7270	HVAC - High Efficiency Boilers (condensing)	Boiler replacement study HYDROTHERM 4	\$12,304
2015-16	Iroquois Falls PS, Building ID 5490-1	7247	BUILDING ENVELOPE - New Roof	roof repairs	\$9,810
2015-16	Iroquois Falls SS, Building ID 5006-1	7249	BUILDING ENVELOPE - New Roof	roof replacement	\$81,663

2015-16	Iroquois Falls SS, Building ID 5006-1	7267	LIGHTING - Outdoor Lighting	exterior lighting	\$20,050
2015-16	Joseph H Kennedy PS, Building ID 6252-1	7254	HVAC - High Efficiency Boilers (condensing)	Boiler Replacement - HYDROTHERM	\$212,280
2015-16	Joseph H Kennedy PS, Building ID 6252-1	7252	BUILDING ENVELOPE - Other (Describe)	Exterior walls - Major Repair (addition 2)	\$36,177
2015-16	Kapuskasing DHS, Building ID 5007-1	7188	HVAC - High Efficiency Boilers	Change to hydronic heating in lieu of steam - year 2	\$1,057,169
2015-16	Kapuskasing DHS, Building ID 5007-1	7234	CONTROLS - Other (Describe)	EBI BAS upgrade - continuation year 2	\$18,879
2015-16	Kapuskasing DHS, Building ID 5007-1	7250	BUILDING ENVELOPE - New Roof	roof replacement B wing - year 1	\$232,845
2015-16	Kapuskasing DHS, Building ID 5007-1	7250	HVAC - Energy efficient HVAC systems	replace air handling units - unit delivery only - year 1	\$106,007
2015-16	Kerns PS, Building ID 6097-1	7204	BUILDING ENVELOPE - New Roof	Partial roof replacement - continuation year 2	\$251,123
2015-16	Roland Michener SS, Building ID 8378-1	7161	BUILDING ENVELOPE - Other (Describe)	Exterior caulking; masonry and precast repair -Replace precast panels that are cracked with granex - year 3	\$3,000
2015-16	Schumacher PS, Building ID 6647-1	7259	HVAC - High Efficiency Boilers (condensing)	Boiler replacement study HYDROTHERM 4 - year 1	\$13,086
2015-16	Smooth Rocks Falls PS, Building ID 5106-1	7255	HVAC - High Efficiency Boilers (condensing)	Boiler replacement - HYDROTHERM	\$229,523
2015-16	Temagami PS, Building ID 6765-1	7210	BUILDING ENVELOPE - New Roof	Replace roofing - year 1	\$247,516
2015-16	Temagami PS, Building ID 6765-1	7277	HVAC - High Efficiency Boilers (condensing)	Boiler replacement- Hydrotherm	\$207,354
2015-16	Timmins H & VS, Building ID 8406-1	7260	HVAC - Efficient Chillers and Controls	chiller replacement - year 1	\$383,786
2015-16	Timmins H & VS, Building ID 8406-1	7263	ELECTRICAL - Other (Describe)	electrical transformer replacement	\$334,361
2015-16	W Earle Miller PS, Building ID 6283-1	7265	BUILDING ENVELOPE - New Roof	roof replacement	\$112,106
	TOTAL 2015-2016				\$4,109,723
2016-17	Clayton Brown PS, Building ID 8834-1	7302	BUILDING ENVELOPE - New Roof	Replacement Roof Coverings - year 1	\$282,895
2016-17	Clayton Brown PS, Building ID 8834-1	7390	HVAC - High-efficiency boiler	Boiler Replacement	\$190,677
2016-17	Cochrane HS, E.s., Building ID 5004-1	7313	HVAC - Other (Describe)	Terminal Package Units	\$12,964
2016-17	Elk Lake PS, Building ID 6059-1	7209	BUILDING ENVELOPE - New roof	Replace roofing - continuation year 2	\$8,201
2016-17	Englehart HS, Building ID 8204-1	7294	LIGHTING - High Efficiency Lighting Systems (LED)	LED Lighting System Upgrade	\$78,072
2016-17	Englehart PS, Building ID 5792-1	7303	BUILDING ENVELOPE - New roof	roof replacement - year 1	\$47,596
2016-17	Englehart PS, Building ID 5792-1	7295	LIGHTING - High Efficiency Lighting Systems (LED)	LED Lighting System Upgrade - year 1	\$56,912
2016-17	Federal Public School, Building ID 8864-1	7391	HVAC - High Efficiency Boilers (condensing)	Boiler replacement HYDROTHERM 4 - year 1	\$86,953
2016-17	Golden Avenue PS, Building ID 5900-1	7287	HVAC - Energy efficient Rooftop units	ERV Replacement	\$83,619
2016-17	Golden Avenue PS, Building ID 5900-1	7398	HVAC - Energy efficient Rooftop units	Rooftop unit replacement - year 1	\$16,608
2016-17	Golden Avenue PS, Building ID 5900-1	7392	LIGHTING - High Efficiency Lighting Systems (LED)	LED Lighting System Upgrade - year 1	\$4,073
2016-17	Iroquois Falls SS, Building ID 5006-1	7249	BUILDING ENVELOPE - New Roof	Roof Replacement (above 325)	\$28,734
2016-17	Iroquois Falls SS, Building ID 5006-1	7304	BUILDING ENVELOPE - New Roof	Gym Roof Replacement - year 1	\$323,769
2016-17	Joseph H Kennedy PS, Building ID 6252-1	7305	HVAC - Energy efficient Rooftop units	Rooftop Unit Replacement - year 1	\$117,867
2016-17	Kapuskasing DHS, Building ID 5007-1	7188	HVAC - High Efficiency Boilers	Change to hydronic heating in lieu of steam - year 3	\$787,665
2016-17	Kapuskasing DHS, Building ID 5007-1	7250	BUILDING ENVELOPE - New Roof	roof replacement includes - continuation year 2	\$22,061
2016-17	Kapuskasing DHS, Building ID 5007-1	7250	HVAC - Energy efficient HVAC systems	replace air handling unit - continuation year 2	\$10,317
2016-17	Kirkland Lake District Composite School, Building ID 12029-1	7292	LIGHTING - High Efficiency Lighting Systems (LED)	LED Lighting System Upgrade	\$205,522
2016-17	Pincrest PS, Building ID 6462-1	9803	BUILDING ENVELOPE - Other (Describe)	Exterior Façade - year 1	\$138,378
2016-17	Roland Michener SS, Building ID 8378-1	7306	BUILDING ENVELOPE - New Roof	Stairwell and cafeteria Roof Replacement - year 1	\$235,613
2016-17	Schumacher PS, Building ID 6647-1	7259	HVAC - High Efficiency Boilers (condensing)	Replace HYDROTHERM Boilers -year 2	\$117,680
2016-17	Temagami PS, Building ID 6765-1	7210	BUILDING ENVELOPE - New roof	roof replacement - continuation year 2	\$16,920
2016-17	Temagami PS, Building ID 6765-1	7353	BUILDING ENVELOPE - Other (Describe)	Major Repair Exterior Walls - Architectural Blocks - Original Building and Addition 1] - year 1	\$181,222
2016-17	Timiskaming Dist.SS, Building ID 8394-1	7356	HVAC - Efficient Chillers and Controls	Replace 3 water cooled units - year 1	\$139,775
2016-17	Timmins H & VS, Building ID 8406-1	7336	HVAC - Efficient Chillers and Controls	Condenser cooling coil	\$27,435
2016-17	Timmins H & VS, Building ID 8406-1	7330	HVAC - Other (Describe)	Replace circulating pump	\$39,040
2016-17	Timmins H & VS, Building ID 8406-1	7260	HVAC - Efficient Chillers and Controls	Chiller Replacement - year 2	\$59,516
2016-17	Timmins H & VS, Building ID 8406-1	7291	LIGHTING - High Efficiency Lighting Systems (LED)	LED Lighting System Upgrade - year 1	\$2,598
2016-17	W Earle Miller PS, Building ID 6283-1	7298	LIGHTING - High Efficiency Lighting Systems (LED)	LED Lighting System Upgrade - year 1	\$2,027
	TOTAL 2016-2017				\$3,324,709
2017-18	Bertha Shaw PS, Building ID 5413-1	7558	BUILDING ENVELOPE - Other (Describe)	Replacement Exterior Doors	\$9,693
2017-18	Clayton Brown PS, Building ID 8834-1	7297	LIGHTING - Occupancy Sensors	Retrofit Interior Lighting including room sensors	\$100,989

2017-18	Clayton Brown PS, Building ID 8834-1	7302	BUILDING ENVELOPE - New Roof	roofing replacement- continuation year 2	\$1,712
2017-18	Clayton Brown PS, Building ID 8834-1	7467	BUILDING ENVELOPE - New Windows	Replace exterior windows	\$58,378
2017-18	Clayton Brown PS, Building ID 8834-1	7390	HVAC - High Efficiency Boilers	Replace boilers	\$87,793
2017-18	Cochrane HS, E.s., Building ID 5004-1	7293	LIGHTING - High Efficiency Lighting Systems (T-8, T-5, CFL, LED ...)	Retrofit interior and exterior lighting	\$315,983
2017-18	Elk Lake PS, Building ID 6059-1	7454	BUILDING ENVELOPE - New Windows	Exterior window replacement (wood) - year 1	\$5,552
2017-18	Englehart HS, Building ID 8204-1	7344	BUILDING ENVELOPE - New Roof Partial	Replacement Roof Coverings Consulting costs only - year 1	\$15,997
2017-18	Englehart PS, Building ID 5792-1	7457	BUILDING ENVELOPE - New Windows	Replace windows	\$66,151
2017-18	Englehart PS, Building ID 5792-1	7303	BUILDING ENVELOPE - New Roof	Roof Replacement - continuation year 2	\$299,934
2017-18	Englehart PS, Building ID 5792-1	7295	LIGHTING - High Efficiency Lighting Systems (T-8, T-5, CFL, LED ...)	Replacement Lighting Equipment - Exit Building - continuation year 2	\$415
2017-18	Federal Public School, Building ID 8864-1	7549	HVAC - Energy efficient Rooftop units	Replace roof top air make up unit	\$409,279
2017-18	Federal Public School, Building ID 8864-1	7391	HVAC - High Efficiency Boilers (condensing)	Boiler replacement HYDROTHERM 4 - year 2	\$56,579
2017-18	Golden Avenue PS, Building ID 5900-1	7453	BUILDING ENVELOPE - New Roof	Roof replacement	\$151,127
2017-18	Golden Avenue PS, Building ID 5900-1	7398	HVAC - Energy efficient Rooftop units	roof top AHU replacement - year 2	\$480,340
2017-18	Golden Avenue PS, Building ID 5900-1	7392	LIGHTING - High Efficiency Lighting Systems (LED)	LED Lighting System Upgrade - continuation year 2	\$74,778
2017-18	Iroquois Falls SS, Building ID 5006-1	7471	BUILDING ENVELOPE - New Roof	Boiler room roof replacement - year 1	\$87,545
2017-18	Iroquois Falls SS, Building ID 5006-1	7304	BUILDING ENVELOPE - New Roof	gym room roof replacement - continuation year 2	\$76,662
2017-18	Iroquois Falls SS, Building ID 5006-1	7565	HVAC - Demand Ventilation Partial	Herman Neilson Terminal & Package Units Replacement - continuation year 3	\$11,697
2017-18	Joseph H Kennedy PS, Building ID 6252-1	7305	HVAC - Energy efficient Rooftop units	Rooftop Unit Replacement - continuation year 2	\$3,142
2017-18	Kapuskasing DHS, Building ID 5007-1	7188	HVAC - High Efficiency Boilers	Change to hydronic heating in lieu of steam - year 4	\$584
2017-18	Kapuskasing DHS, Building ID 5007-1	7327	CONTROLS - Other (Describe)	Replace pad mount electrical transformer	\$24,763
2017-18	Kapuskasing DHS, Building ID 5007-1	7479	CONTROLS - Other (Describe)	Replace pneumatic controls with electronics - year 1	\$23,682
2017-18	Kapuskasing DHS, Building ID 5007-1	7296	LIGHTING - High Efficiency Lighting Systems (LED)	Retrofit interior and exterior lighting include sensors	\$315,092
2017-18	Kapuskasing DHS, Building ID 5007-1	7474	BUILDING ENVELOPE - New Roof	roof replacement - year 1	\$294,871
2017-18	Kapuskasing DHS, Building ID 5007-1	9817	LIGHTING - Occupancy Sensors	gym lights occupancy sensors	\$3,576
2017-18	Kirkland Lake District Composite School, Building ID 12029-1	7292	LIGHTING - High Efficiency Lighting Systems (LED)	LED Lighting System Upgrade	\$30,431
2017-18	Kirkland Lake District Composite School, Building ID 12029-1	7465	ELECTRICAL - Other	Voltage Harmonizer - year 1	\$50,259
2017-18	New Liskeard Board Office	7432	BUILDING ENVELOPE - New Windows	Window Replacement	\$37,053
2017-18	Pincrest PS, Building ID 6462-1	7299	LIGHTING - High Efficiency Lighting Systems (LED)	Retrofit interior and exterior lighting to LED	\$58,428
2017-18	Pincrest PS, Building ID 6462-1	7308	BUILDING ENVELOPE - Other (Describe)	Exterior Façade - continuation year 2	\$279,132
2017-18	Pincrest PS, Building ID 6462-1	7484	BUILDING ENVELOPE - New Roof	roof replacement - year 1	\$438,159
2017-18	Roland Michener SS, Building ID 8378-1	7306	BUILDING ENVELOPE - New Roof	Stairwell and cafeteria Roof Replacement - continuation year 2	\$1,610
2017-18	Roland Michener SS, Building ID 8378-1	7486	BUILDING ENVELOPE - Other (Describe)	exterior door replacement	\$21,644
2017-18	Roland Michener SS, Building ID 8378-1	7489	HVAC - Efficient Chillers and Controls	cooling unit replacement for office and library	\$105,140
2017-18	Roland Michener SS, Building ID 8378-1	7488	BUILDING ENVELOPE - New Roof	replace roof above shop wing	\$428,980
2017-18	Schumacher PS, Building ID 6647-1	7259	HVAC - High Efficiency Boilers (condensing)	Replace HYDROTHERM Boilers -year 3	\$18,566
2017-18	Smooth Rocks Fall PS, Building ID 5106-1	7300	LIGHTING - High Efficiency Lighting Systems (LED)	retrofit interior and exterior lighting to LED	\$44,218
2017-18	Temagami PS, Building ID 6765-1	7553	HVAC - Energy efficient HVAC systems	replace air handling units - year 1	\$202,031
2017-18	Temagami PS, Building ID 6765-1	7353	BUILDING ENVELOPE - Other (Describe)	Major Repair Exterior Walls - Architectural Blocks - Original Building and Addition 1] - year 2	\$13,433
2017-18	Timiskaming Dist.SS, Building ID 8394-1	7464	ELECTRICAL - Other	Voltage Harmonizer - year 1	\$45,150
2017-18	Timiskaming Dist.SS, Building ID 8394-1	7356	HVAC - Efficient Chillers and Controls	Replace 3 water cooled units - continuation year 2	\$38,204
2017-18	Timmins H & VS, Building ID 8406-1	7463	ELECTRICAL - Other	Voltage Harmonizer	\$67,012
2017-18	Timmins H & VS, Building ID 8406-1	7291	LIGHTING - High Efficiency Lighting Systems (LED)	retrofit interior and exterior lighting to LED - continuation year 2	\$329,289
2017-18	Timmins H & VS, Building ID 8406-1	9814	CONTROLS - Other (Describe)	Install balancing valves to reduce flow from recirculating pumps	\$4,619
2017-18	W Earle Miller PS, Building ID 6283-1	7298	LIGHTING - High Efficiency Lighting Systems (LED)	LED Lighting System Upgrade - conrinuation year 2	\$83,419
	TOTAL 2017-2018				\$5,273,091

APPENDIX H

Total Investment in Energy Management Strategies FY 2012-13 to FY 2017-18						
	2013-14	2014-15	2015-16	2016-17	2017-18	2013/14-2017/18
	Investment in Energy Management Strategies	Investment in Energy Management Strategies	Investment in Energy Management Strategies	Investment in Energy Management Strategies	Investment in Energy Management Strategies	Total Investment in Energy Management Strategies
Design, Construction and Retrofit Strategies Total	\$ 2,058,553	\$ 1,857,855	\$ 4,109,723	\$ 3,324,709	\$ 5,273,091	16,623,931
Operations and Maintenance Strategies Total	\$ -	\$ -	\$ -	\$ -	\$ -	0
Occupant Behaviour Strategies Total	\$ -	\$ -	\$ -	\$ -	\$ -	0
Total Investment Per Fiscal Year	\$ 2,058,553	\$ 1,857,855	\$ 4,109,723	\$ 3,324,709	\$ 5,273,091	16,623,931

APPENDIX I

District School Board Ontario North East - FY2018 / AF2018 - Energy Intensity						
Schools	Year Built	Total Building Area (includes portables and portapaks) (ft²)	Electricity Intensity (ekWh/ft²)	Natural Gas Intensity (ekWh/ft²)	Energy Intensity (EI) (ekWh/ft²)	Rank
Diamond Jubilee Storage	1927	263.72	0.16	0.00	0.16	1
Kerns Public School	1961	23,154.00	8.10	0.00	8.10	2
Temagami Public School	1957	27,201.00	2.86	9.88	12.74	3
W. Earle Miller Public School	1985	37,452.00	4.26	10.06	14.32	4
Central Public School	1964	24,523.00	3.56	10.88	14.44	5
R. Ross Beattie Sr. Public School	1970	55,855.00	5.47	10.79	16.26	6
Timmins High & Vocational School	1980	194,004.00	7.48	9.15	16.63	7
Haileybury Public School -CLOSED JUL16	1924	38,999.00	2.15	14.55	16.70	8
New Liskeard Board Office	1968	8,220.00	17.09	0.00	17.09	9
Elk Lake Public School	1969	11,464.00	17.37	0.00	17.37	10
Englehart Public School	1964	36,419.00	12.34	5.36	17.69	11
Joseph H Kennedy Public School	1953	38,279.00	3.30	14.87	18.18	12
Kapuskasing District High School & Diamond Jubilee	1939	157,947.00	4.59	13.88	18.47	13
Englehart High School	1957	58,903.00	5.34	13.71	19.05	14
Bertha Shaw Public School	1965	26,934.00	5.62	14.01	19.63	15
Kirkland Lake District Composite School & Elementary	2006	110,000.00	6.47	13.27	19.75	16
Smooth Rock Falls PS	1981	29,688.00	3.39	17.35	20.74	17
Clayton Brown Public School	1950	39,897.00	3.41	17.37	20.78	18
Timmins Centennial Public School	2011	56,563.00	7.69	13.17	20.86	19
ES Cochrane HS & PS	1972	123,241.00	4.88	16.11	21.00	20
Schumacher Public School	1909	45,037.00	5.62	15.46	21.08	21
Iroquois Falls Public School	1967	46,964.00	5.28	16.37	21.65	22
Timiskaming District Secondary School	1953	159,884.00	5.39	16.49	21.88	23
Timiskaming District SS (New Liskeard Maintenance)	1989	2,675.00	8.96	12.93	21.90	24
Federal Public School	1977	24,910.00	4.65	17.80	22.45	25
Pinecrest Public School	1950	27,826.00	4.37	19.02	23.39	26
Schumacher Board Office	2014	19,224.00	9.95	13.45	23.41	27
Golden Avenue Public School	1975	35,527.00	5.53	18.58	24.11	28
Iroquois Falls Secondary School	1941	156,013.00	4.46	20.11	24.57	29
New Liskeard Public School	1950	59,665.00	5.89	19.29	25.19	30
Roland Michener Secondary School	1947	128,170.00	5.20	19.99	25.19	31
Kinder School (Kirkland Lake Mtce. Shop)	1959	3,900.00	4.13	24.61	28.73	32
P.A.C.E.- leased	0	2,910.00	18.08	34.82	52.90	33