



**Huron-Perth CDSB Energy Conservation and Demand
Management Plan for Fiscal Year 2023-2024 to Fiscal
Year 2027-2028**

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Education Sector Background

Funding and Energy Management Planning

Each year school boards receive approximately \$1.4 billion school renewal funding from the province. In addition, school boards may receive time-limited funds over this period.

The Ministry typically announces each Board's funding allocations, for the upcoming school board Fiscal Year (September 1st to August 31st), in March-April.

While a board may have a five-year energy management strategy, the ability to implement their strategy depends on the funding that's received for each of the five years covered by their plan.

Asset Portfolios and Energy Management Planning

The education sector is unique in that a board's asset portfolio can experience important changes that crucially 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.

Facility Variables:

- Construction
 - Year built
 - Number of floors
 - Orientation of the building
- Building Area
 - Major additions
 - Sites sold/closed/demolished/leased
 - Portables
 - Installed
 - Removed
 - Areas under construction
- Equipment/Systems
- Age
- Type of technology
- Lifecycle
- Percentage of air-conditioned space
- Site Use
 - Elementary school
 - Secondary school

- Administrative building
 - Maintenance/warehouse facility
 - Community Hubs
- Shared Site Use (For example: two or more boards share common areas and/or partnered with a municipality)
 - Swimming pools
 - Libraries
 - Lighted sports fields
 - Sports domes

Other Variables:

- Programs
 - Childcare
 - 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

PART I: A REVIEW OF PROGRESS & ACHIEVEMENTS in the PAST FIVE YEARS

A. The Board's Asset Portfolio

The following table outlines the energy-related variables and metrics in the Board's asset portfolio that changed from the baseline Fiscal Year 2017 to 2018 to the end of the five-year reporting period Fiscal Year 2022 to 2023.

Table 1: Board's Asset Portfolio

Key Metrics	(Baseline Year) Fiscal Year 2017 to 2018	Fiscal Year 2022 to 2023	Variance
Total Number of Buildings	19	19	0
Total Number of Portables/Portapaks	20	23	3
Total Floor Area	53783	54983	1200
Average Operating Hours	64	64	0
Average Daily Enrolment	4572	4563.75	-8.25
% of Total Floor Area Air Conditioned	84	98	14
Number of Facilities with Mechanical Ventilation	13	18	5

B. Energy Usage Data for the Board

The following table lists the "metered"¹ consumption values in the common unit of Equivalent Kilowatt Hours (ekWh) and Kilowatt Hours (kWh).

Table 2: Metered Usage Values

Utility	Fiscal Year 2017 to 2018 (Baseline year)	Fiscal Year 2022 to 2023
Total Electricity (kWh)	5350808	5307236
Total Natural Gas (ekWh)	7060832	6851470

C. Weather Normalized Energy Consumption Values

In Ontario, 25% to 35% of energy consumption for a facility is affected by weather.

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

To demonstrate the effect of weather, the following table 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.

Table 3: Ontario Degree-days

Ontario Degree Days	Fiscal Year 2017 to 2018	Fiscal Year 2018 to 2019	Fiscal Year 2019 to 2020	Fiscal Year 2020 to 2021	Fiscal Year 2021 to 2022	Fiscal Year 2022 to 2023
HDD	3989	4196	3837	3696	3799	3,611
CDD	432	334	415	392	340	267

The best way to compare energy usage 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 changes in buildings’ features (refer to the Facility Variables listed on pages 5 and 6), and newly implemented programs (refer to the Note to Readers on pages 10-12) which will greatly impact energy consumption.

As a result, weather normalized Energy Intensity⁴ is the most accurate measurement that allows the evaluation of a board’s energy use from one year to another as it cancels out any change in floor area. The unit of measurement used is either equivalent kilowatt hours per square foot (ekWh/ft²) or equivalent kilowatt hours per square metre (ekWh/m²).

Table 4: Weather Normalized Values

Weather Normalized Values	Fiscal Year 2017 to 2018 (Baseline Year)	Fiscal Year 2022 to 2023 (Most Recent Data Available)
Total Energy Consumed (ekWh)	12283238	12285676

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.

⁴ Energy Intensity (known as EI) is the quantity of total energy consumed divided by the total floor area. EI is typically expressed as equivalent kilowatt hours per square foot (ekWh/ft²), gigajoule per square metre (GJ /m²), etc., depending on the user’s preference.

Weather Normalized Values	Fiscal Year 2017 to 2018 (Baseline Year)	Fiscal Year 2022 to 2023 (Most Recent Data Available)
Energy Intensity (ekWh/m ²)	228.39	223.44
Total GHG Emissions (kgCO ₂)	1834778.75	1411228.88
Emissions Intensity (kgCO ₂ /m ²)	33.94	25.67

D. Review of Previous Energy Conservation Goals and Achievements

In 2019, the Board set annual energy conservation goals for the following five fiscal years. The following table compares the Energy Intensity Conservation Goal with the Actual Energy Intensity Reduced for each year.

Table 5: Comparison of Energy Intensity Conservation Goal and Actual Energy Intensity Reduced

Fiscal Year	Conservation Goal ekWh/m ²	Conservation Goal Percentage	Actual Energy Savings ekWh/m ²	Actual Energy Percentage
2018 to 2019	9.93	4.30	-9.61	-4.21
2019 to 2020	2.57	1.11	23.77	9.99
2020 to 2021	4.34	1.88	-9.56	-4.46
2021-2022	2.58	1.11	-8.02	-3.58
2022 to 2023	2.45	1.06	8.35	3.60

NOTE TO READERS:

When reviewing annual Actual Energy Savings and Actual Energy Percentage across the five (5) years in the chart above, the following should be considered:

1. Conservation goals in the above chart were forecast in Spring 2019 based on the assumption that operational parameters would remain consistent from FY2019 through FY2023. However, the pandemic that arrived in early 2020, significantly changed how schools operated and impacted their energy consumption.

1. As a result of significant operational changes from one year to the next from FY2019 to FY2023, an apple-to-apple comparison of Energy Intensity (ekWh/ft² – the quantity of energy consumed per area) is not possible.
 - Factors that reduced energy consumption include:
 - temporary school closures in FY2020 and FY2021, due to the pandemic
 - boards with centralized Building Automation Systems (BAS) that could be remotely programed to “unoccupied set points”, should show a reduction in consumption
 - temporary suspension of community use of schools, before/after school programs, childcare programs, continuing education and summer school programs
 - for schools with these programs, the number of “occupied set point” operating hours would be significantly reduced
 - Factors that increased consumption include:
 - Implementation of new health and safety factors in FY2021 through FY2023 to address pandemic issues, such as:
 - increased ventilation (intake of fresh air),
 - increased filtration requirements
 - expanded operating hours of HVAC equipment

A board’s ability to achieve their 2019 forecasted Conservation Goals may be limited by some or all the above factors.

In addition to the pandemic-related factors outlined above, there are a number of other factors that regularly impact a board’s ability to achieve their conservation goals, including:

Before and After School Programs

Before-School and After-School Programs need a facility’s Heating, Ventilation, and Air Conditioning (also known as HVAC) system to operate for an extended period of time on a daily basis, which increases the overall energy intensity.

Community Use of Schools

Both indoor and outdoor school space is available to not-for-profit community groups at reduced rates, outside of regular school hours. The use of spaces in schools, typically gymnasiums and libraries, has increased over time. The use of these spaces during non-school hours requires a facility’s HVAC system to operate for an extended period on a daily basis, which will increase the overall energy intensity.

Community Hubs

Many schools now offer a greater range of:

- events (cultural),
- programs (arts, recreation, childcare), and

- services (health, family resource centres).

The dramatic increase in community use means that many schools now run from 6:00 a.m. until 11:00 p.m. during weekdays and are open many times on weekends. The use of these spaces during non-school hours requires a facility's HVAC system to operate for an extended period on a daily basis, which will increase the overall energy intensity.

Air Conditioning

Historically, schools have not had air conditioning, or it has been a minimal space in the facility. However, with changing weather patterns, "shoulder seasons" such as May, June and September are experiencing higher than normal temperatures and there is an increased desire for schools to have air conditioning. Air conditioning significantly increases a facility's energy use, specifically electricity consumption.

Compliance with current Ontario Building Code (also known as OBC)

When renovations or an addition is built onto an existing school, in-place equipment such as HVAC systems, lighting etc., may be required to meet current OBC standards which may result in increased energy use.

For example, under the OBC, buildings built today have increased ventilation requirements, meaning more outside air is brought into a facility. As a result, HVAC systems need to work longer to heat or cool the outdoor air to bring it to the same temperature as the standard indoor temperature for the building.

Pandemic

When reviewing year-over-year value, it should be noted that FY2020 values will be lower as schools were closed due to the pandemic (March 2020 until June 2020). During that time, the sector saw a decrease of 16% in electricity consumption and 3% in natural gas consumption. The difference in the percentage for the two utilities, reflects that natural gas is primarily used for heating and April, May and June do not have the same heating demands due to weather.

In FY2021 consumption values were typically higher than FY2020, but due to limited occupancy as a result of the ongoing pandemic, lower than previous consumption levels.

Ventilation and Filtration

In consultation with the Office of the Chief Medical Officer of Health, the Ministry of Labour, Immigration, Training and Skills Development and others, school boards have been expected continue to build on established practices to optimize air quality to support healthy and safe learning environments for students and staff.

Many of these new recommendations/requirements can impact utility consumption. For instance, the implementation of standalone HEPA filtration units has impacted energy

consumption, primarily electricity.

E. Cumulative Energy Conservation Goal

The following table compares the 2019 Forecasted Cumulative Energy Intensity Conservation Goal with the Actual Cumulative Energy Intensity Reduced Savings.

Table 6: Cumulative Energy Intensity Goal from Fiscal Year 2018 to 2019 through Fiscal Year 2022 to 2023

Cumulative Energy Intensity	(ekWh/m2)	Variance
Forecasted Cumulative Energy Intensity Conservation Goal of Fiscal Year 2018 to 2019 through Fiscal Year 2022 to 2023	21.87	
Forecasted Cumulative Energy Intensity Conservation Goal as a Percentage		9.46
Actual Cumulative Energy Intensity Reduced or Increased from Fiscal Year 2018 to 2019 through Fiscal Year 2022 to 2023 – Weather Normalized	4.94	
Variance between 2019 Forecast Cumulative Conservation Goal and Actual Cumulative Energy Intensity– Weather Normalized	-16.93	
% of Cumulative Energy Intensity Conservation Goal Achieved - Weather Normalized		22.60

F. Measures Implemented from Fiscal Year 2018 to 2019 to Fiscal Year 2022 to 2023

A list of the measures implemented, the related costs, and the fiscal year that the measure was implemented within the Board are outlined in **Appendix: Investments in Energy Efficiency between Fiscal Year 2019 and Fiscal Year 2023**. Here is the list of sheets:

1. Design, Construction and Retrofit Investments

2. Operations and Maintenance Investments
3. Occupant Behaviour Investments
4. Renewable Energy Investments
5. Summary of All Investment Types

NOTE TO READERS:

Important Consideration - It takes a minimum of one full year after an energy management strategy has been implemented before an evaluation can measure the related actual energy savings achieved.

PART II – ENERGY CONSERVATION and DEMAND MANAGEMENT PLAN for FISCAL YEAR 2022 to 2023 to FISCAL YEAR 2027 to 2028

Part II outlines the board's plan to reduce energy consumption through renewable energy and energy management strategies including:

1. Design, Construction and Retrofit;
2. Operations and Maintenance; and lastly
3. Occupant Behavior.

Background

1. To date the Board's energy management strategy has included the following:
 - Utilize natural light
 - When undertaking lighting upgrades in schools, ensure occupancy sensors are included as part of the upgrade
 - 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 conversation
 - Ensure that windows are closed at the end of the school day
 - Ensure that space around vents, windows and doors are kept free from obstructions, that windows and doors are closed when possible and that weather stripping is examined for deficiencies and replaced when necessary
 - Ensure that schools, during the heating season, adhere to Board standard room temperatures of 21 degrees Celsius or less and 15 degrees Celsius during weekends and school breaks
 - Promote the reduction of heat in areas not being utilized
 - Make maximum use of its computer controlled temperature systems
 - Encourage staff to turn off air conditioning when building is not utilized
 - Ensure that air conditioners are not set lower than 10 degrees Celsius below outside temperature
 - Consider the use of energy efficiency products (wherever possible)
 - Consider the use of renewable sources of energy, if practical (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
 - Prepare annual Energy Consumption and Greenhouse Gas Emissions Report for all sites as required by O.Reg. 397/11 and post on Board website

- Prepare an Energy Conservation and Demand Management Plan as required by O Reg. 397/11 and post on Board website
2. The Board does not have a dedicated energy management position. The Facilities Manager is responsible for energy management.
 3. Energy Management Strategies

Energy management strategies fall into four key categories:

1. Renewable Energy
2. Design/Construction/Retrofit
3. Operations and Maintenance
4. Occupant Behaviour

Renewable Energy

Definition

Renewable energy is a strategy to cut down a board's energy use from the province's electricity grid and includes:

- solar panels
- wind turbines, etc.

For a list of the Board's renewable energy projects, please refer to the **Calculating Energy Conservation Goals Fiscal Year 2024 to Fiscal Year 2028** explained in **Appendix A: Renewable Energy**.

Design/Construction/Retrofit

Definition

Design, construction, and retrofit includes the original and ongoing intent of how a building and its systems are to work through the combination of disciplines such as architecture and engineering.

For the Board's relevant projects over the next five years, please refer to **Calculating Energy Conservation Goals Fiscal Year 2023 to 2024 to Fiscal Year 2027 to 2028, Appendix B: Design, Construction, and Retrofit**.

Operations and Maintenance

Definition

Operations and maintenance include the strategies the Board uses to make sure that the existing buildings and equipment performs at maximum efficiency.

For the Board's relevant projects over the next five years, please refer to **Calculating Energy Conservation Goals Fiscal Year 2023 to 2024 to Fiscal Year 2027 to 2028, Appendix C: Operations and Maintenance**.

Occupant Behaviour

Definition

Strategies that the Board uses to teach occupants, including staff, students and community users, with an emphasis on changing specific actions to reduce energy consumption.

For the Board's relevant projects over the next five years, please refer to **Calculating Energy Conservation Goals Fiscal Year 2023 to 2024 to Fiscal Year 2027 to 2028, Appendix D: Occupant Behaviour.**

A. Future Energy Conservation Goals

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

Table 7: Annual Energy Intensity Conservation Goals

Annual Energy Intensity Conservation Goal	Fiscal Year 2023 to 2024	Fiscal Year 2024 to 2025	Fiscal Year 2025 to 2026	Fiscal Year 2026 to 2027	Fiscal Year 2027 to 2028
ekW/m ²	2.38	3.55	3.11	1.47	1.42
Percentage Decrease	5.44	8.12	7.11	3.35	3.24

The following table shows the Board's Cumulative Energy Intensity Conservation Goal for the next five fiscal years.

Table 8: Cumulative Conservation Goal

Cumulative Conservation Goal	Fiscal Year 2023 to 2024 through Fiscal Year 2027 to 2028
ekWh/m ²	11.94
Percentage Decrease	27.27

B. Environmental Programs

In Fiscal Year 2022 to 2023, schools within the Board participated in environmental programs.

1. Development and Peace Schools program which is rooted in our Catholic Faith
Eighteen of our schools participate

C. Energy Efficiency Incentives

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

☒ Yes ☐ No

Between Fiscal Year 2018 to 2019 and Fiscal Year 2022 to 2023, the Board has applied for and received \$ 9,375.00 in incentive funding from different agencies to support the implementation of energy efficient projects.

2. The Board uses external resources, such as IESO Service Representatives and / or Enbridge Service Representatives, to apply for incentives.

☒ Yes

☐ No

☐ IESO Service Representative

☒ Enbridge Service Representative

☐ Other

D. Energy Procurement

1. The Board participates in a consortia arrangement to purchase electricity.

☒ Yes

☐ No

If yes,

☒ OECM's Strategic Electricity Management and Advisory Services

☐ Other:

Provide Name of Consortia:

2. The Board participates in a consortia arrangement to purchase natural gas.

☒ Yes

☐ No

If yes,

☒ Ontario Education Collaborative Marketplace's (also known as OECM) Natural Gas Management and Advisory Services

☐ Other:

Provide Name of Consortia:

3. The Board participates in a consortia arrangement to purchase alternative utilities (fuel oil, propane, wood, district heat, district cool).

☐ Yes

☒ No – N/A

If yes,

1. ☐ Ontario Education Collaborative Marketplace's (also known as OECM)

2. ☐ Other:

Provide Name of Consortia:

E. Demand Management

1. The Board uses the following method(s) to monitor electrical Demand:

☒ Invoices

☐ Real-time data

☒ Online data from the Local Distribution Company (LDC)

☐ Other:

2. The Board uses the following methodologies to cut down electrical Demand:

☒ Equipment scheduling

☒ Phased/staged use of equipment

☐ Demand-limit equipment

☐ Deferred start-up of large equipment (e.g. chiller start-up in spring)

☐ Other:

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

I confirm that Huron-Perth CDSB senior management has reviewed and approved this Energy Conservation and Demand Management Plan.

Full Name: Mary-Ellen Ducharme *Mary-Ellen Ducharme*

Job Title: Superintendent of Business and Treasurer

Date: June 19, 2024

Design, Construction and Retrofit Strategies

		2018-2019	2019-20	2020-2021	2021-2022	2022-2023
Lighting / Electrical		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
High Efficiency Lighting Systems (D5020, D502001, D502004)		\$ 76,130	\$ 26,775	\$ 42,131	\$ 4,142	\$ -
Outdoor Lighting (D502004)		\$ -	\$ -	\$ -	\$ -	\$ -
Occupancy Sensors (D5021, D5022)		\$ -	\$ -	\$ -	\$ -	\$ -
Daylight Harvesting		\$ -	\$ -	\$ -	\$ -	\$ -
Dimming Switches		\$ -	\$ -	\$ -	\$ -	\$ -
Other (Describe)						
		2018-2019	2019-20	2020-2021	2021-2022	2022-2023
HVAC		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
Efficient Boilers (near condensing) (D3020, D302001, D302002)		\$ -	\$ -	\$ -	\$ -	\$ -
High Efficiency Boilers (condensing) (D3020, D302001, D302002)		\$ -	\$ -	\$ -	\$ -	\$ -
High efficiency Boiler Burners (D3020)		\$ -	\$ -	\$ -	\$ -	\$ -
Geothermal (D302099)		\$ -	\$ -	\$ -	\$ -	\$ -
Heat Recovery/Entropy Wheels (D3020)		\$ -	\$ -	\$ -	\$ -	\$ -
Economizers (D302002)		\$ -	\$ -	\$ -	\$ -	\$ -
Energy Efficient HVAC systems (D3050, D3040)		\$ 144,814	\$ 1,043,165	\$ 1,309,334	\$ 720,084	\$ 78,841
Energy Efficient Rooftop Units (D3020098)		\$ 2,554	\$ -	\$ 386,212	\$ 487,829	\$ 380,384
High Efficiency Domestic Hot Water (D3020)		\$ 1,328	\$ -	\$ -	\$ -	\$ -
Efficient Chillers and Controls (D3030, D303011, D303012)		\$ -	\$ -	\$ -	\$ -	\$ -
High efficiency Motors (D004007, D303011)		\$ -	\$ -	\$ -	\$ -	\$ -
VFD (D302056)		\$ -	\$ -	\$ -	\$ -	\$ -
Demand Ventilation (D30340)		\$ 76,768	\$ 218,276	\$ 80,898	\$ -	\$ -
Entrance Heater Controls (D302099)		\$ -	\$ -	\$ -	\$ -	\$ -
Deaerification Fans (D30090)		\$ -	\$ -	\$ -	\$ -	\$ -
Heat Pumps		\$ 14,577	\$ -	\$ 29,661	\$ -	\$ -
		2018-2019	2019-20	2020-2021	2021-2022	2022-2023
Controls		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
Building Automation Systems - New (D3090)		\$ 54,472	\$ 150,000	\$ -	\$ -	\$ -
Building Automation Systems - Upgrade (D3060)		\$ -	\$ -	\$ -	\$ -	\$ -
Real-time energy data for operators to identify and diagnose building issues					\$ 4,659	\$ -
Voltage Harmonizers (D501001)						

Other (Describe)	Investment in Energy Management Strategies				Investment in Energy Management Strategies	Investment in Energy Management Strategies	Investment in Energy Management Strategies
	2018-2019	2019-2020	2020-2021	2021-2022			
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Building Envelope							
Glazing (B202006, B2020, B2021)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Increased Wall Insulation (B2010)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
New Roof (B3010, B3020)	\$ 1,378,877	\$ 1,119,295	\$ 414,043	\$ 1,552,866	\$ 1,440,915	\$ 1,440,915	\$ 1,440,915
New Windows (B2020)	\$ -	\$ 395,467	\$ 333,815	\$ 46,524	\$ -	\$ -	\$ -
Treatments	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Shading Devices	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other (Describe)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Investment in Design, Construction and Retrofit Strategies	\$ 1,749,520	\$ 2,958,973	\$ 2,598,394	\$ 2,819,104	\$ 2,819,104	\$ 2,819,104	\$ 1,909,140

Investments in Energy Management Strategies

Operations and Maintenance Strategies

	2018-2019	2019-20	2020-2021	2021-2022	2022-2023
Policy and Planning	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
New School Design/Construction Guidelines and Specifications	\$ -	\$ -	\$ -	\$ -	\$ -
Day and Night Temperature Guidelines for all Schools	\$ -	\$ -	\$ -	\$ -	\$ -
Nighttime Blackout of Sites - Interior	\$ -	\$ -	\$ -	\$ -	\$ -
Nighttime Blackout of Sites - Exterior	\$ -	\$ -	\$ -	\$ -	\$ -
Procures Only Energy Star Certified Appliances	\$ -	\$ -	\$ -	\$ -	\$ -
Preventative Maintenance (re-commissioning, coil cleaning, filter changes)	\$ 30,000	\$ 30,000	\$ 300,000	\$ 30,000	\$ 30,000
Daylight Harvesting (servicing)	\$ -	\$ -	\$ -	\$ -	\$ -
Demand Ventilation (servicing)	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000
Water Leak Detection System	\$ -	\$ -	\$ -	\$ -	\$ -
Other (Describe)	\$ -	\$ -	\$ -	\$ -	\$ -

	2018-2019	2019-20	2020-2021	2021-2022	2022-2023
Energy Audits	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
Walk Through Audit	\$ -	\$ -	\$ -	\$ -	\$ -
Engineering Audit	\$ -	\$ -	\$ -	\$ -	\$ -
Other (Describe)	\$ -	\$ -	\$ -	\$ -	\$ -
Total Investment in Operations and Maintenance Strategies	\$ 31,000	\$ 31,000	\$ 301,000	\$ 31,000	\$ 31,000

Investments in Energy Management Strategies

Occupant Behaviour Strategies

Training and Education	2018--2019	2019-20	2020-2021	2021-2022	2022-2023
Building Operator Training	\$ -	\$ -	\$ -	\$ -	\$ -
Building Automation Training (site specific)	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500
Ongoing Training and Awareness Programs for Energy Conservation	\$ -	\$ -	\$ -	\$ -	\$ -
Provide Detailed Information on Building Operational Costs	\$ -	\$ -	\$ -	\$ -	\$ -
Board policy to limit appliances brought (space heater, mini fridge, coffee machine) into the workspace					
Provide Detailed Information on Energy Consumption (e.g. via the Utility Consumption Database or other database)	\$ -	\$ -	\$ -	\$ -	\$ -
Participate in Environmental Programs, such as EcoSchools, Earthcare	\$ -	\$ -	\$ -	\$ -	\$ -
Schools participate in Development and Peace at no cost	\$ -	\$ -	\$ -	\$ -	\$ -
Total Investment in Occupant Behaviour Strategies	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500

Investments in Energy Management Strategies

Type of Renewable Energy	Investment in Renewable Energy Technology (\$)							Number of systems added	Capacity Added (kW)
	Fiscal Year 2018-2019	Fiscal Year 2019-2020	Fiscal Year 2020-2021	Fiscal Year 2021-2022	Fiscal Year 2022-2023				
Solar Photovoltaic	\$ -	\$ -	\$ -	\$ -	\$ -				
Solar Air	\$ -	\$ -	\$ -	\$ -	\$ -				
Solar Water	\$ -	\$ -	\$ -	\$ -	\$ -				
Wind Turbine	\$ -	\$ -	\$ -	\$ -	\$ -				
Biomass	\$ -	\$ -	\$ -	\$ -	\$ -				
Other	\$ -	\$ -	\$ -	\$ -	\$ -				
Total	\$ -	\$ -	\$ -	\$ -	\$ -				

Investments in Energy Management Strategies

Summary of Investment by Type

Total Investments in Energy Management Strategies FY 2012-13 to FY 2017-18	2018-2019		2019-2020		2020-2021		2021-2022		2022-2023		2018/19-2022/2023	
	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 Investments Total	\$	1,744,320	\$	2,898,472	\$	2,539,384	\$	2,812,104	\$	1,804,140	\$	12,003,131
Operations and Maintenance Investments Total	\$	31,800	\$	31,000	\$	301,000	\$	31,000	\$	31,000	\$	428,000
Occupant Behaviour Investments Total	\$	500	\$	500	\$	500	\$	500	\$	500	\$	2,000
Renewable Energy Investments Total	\$	-	\$	-	\$	-	\$	-	\$	-	\$	0
Total Investment per Fiscal Year	\$	1,776,120	\$	2,930,472	\$	2,841,884	\$	2,843,604	\$	1,866,640	\$	12,431,131

[illegible]

[illegible]

Appendix C

Operations and Maintenance Strategies

Project/Planning	Group of Financial Instruments to be Issued	2022-2024		2024-2026		2026-2028		2028-2030		2030-2032		2032-2034		2034-2036		2036-2038		2038-2040		2040-2042		2042-2044		2044-2046		2046-2048		2048-2050		2050-2052		2052-2054		2054-2056		2056-2058		2058-2060		2060-2062		2062-2064		2064-2066		2066-2068		2068-2070		2070-2072		2072-2074		2074-2076		2076-2078		2078-2080		2080-2082		2082-2084		2084-2086		2086-2088		2088-2090		2090-2092		2092-2094		2094-2096		2096-2098		2098-2100		2100-2102		2102-2104		2104-2106		2106-2108		2108-2110		2110-2112		2112-2114		2114-2116		2116-2118		2118-2120		2120-2122		2122-2124		2124-2126		2126-2128		2128-2130		2130-2132		2132-2134		2134-2136		2136-2138		2138-2140		2140-2142		2142-2144		2144-2146		2146-2148		2148-2150		2150-2152		2152-2154		2154-2156		2156-2158		2158-2160		2160-2162		2162-2164		2164-2166		2166-2168		2168-2170		2170-2172		2172-2174		2174-2176		2176-2178		2178-2180		2180-2182		2182-2184		2184-2186		2186-2188		2188-2190		2190-2192		2192-2194		2194-2196		2196-2198		2198-2200		2200-2202		2202-2204		2204-2206		2206-2208		2208-2210		2210-2212		2212-2214		2214-2216		2216-2218		2218-2220		2220-2222		2222-2224		2224-2226		2226-2228		2228-2230		2230-2232		2232-2234		2234-2236		2236-2238		2238-2240		2240-2242		2242-2244		2244-2246		2246-2248		2248-2250		2250-2252		2252-2254		2254-2256		2256-2258		2258-2260		2260-2262		2262-2264		2264-2266		2266-2268		2268-2270		2270-2272		2272-2274		2274-2276		2276-2278		2278-2280		2280-2282		2282-2284		2284-2286		2286-2288		2288-2290		2290-2292		2292-2294		2294-2296		2296-2298		2298-2300		2300-2302		2302-2304		2304-2306		2306-2308		2308-2310		2310-2312		2312-2314		2314-2316		2316-2318		2318-2320		2320-2322		2322-2324		2324-2326		2326-2328		2328-2330		2330-2332		2332-2334		2334-2336		2336-2338		2338-2340		2340-2342		2342-2344		2344-2346		2346-2348		2348-2350		2350-2352		2352-2354		2354-2356		2356-2358		2358-2360		2360-2362		2362-2364		2364-2366		2366-2368		2368-2370		2370-2372		2372-2374		2374-2376		2376-2378		2378-2380		2380-2382		2382-2384		2384-2386		2386-2388		2388-2390		2390-2392		2392-2394		2394-2396		2396-2398		2398-2400		2400-2402		2402-2404		2404-2406		2406-2408		2408-2410		2410-2412		2412-2414		2414-2416		2416-2418		2418-2420		2420-2422		2422-2424		2424-2426		2426-2428		2428-2430		2430-2432		2432-2434		2434-2436		2436-2438		2438-2440		2440-2442		2442-2444		2444-2446		2446-2448		2448-2450		2450-2452		2452-2454		2454-2456		2456-2458		2458-2460		2460-2462		2462-2464		2464-2466		2466-2468		2468-2470		2470-2472		2472-2474		2474-2476		2476-2478		2478-2480		2480-2482		2482-2484		2484-2486		2486-2488		2488-2490		2490-2492		2492-2494		2494-2496		2496-2498		2498-2	
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Keys	
\$90.1187	= cost of 1 kWh electricity
\$90.02393	= cost of 1 kWh natural gas
0.09943	$m = 1$ kWh
\$90.4116	= cost of 1 m ³ natural gas

[illegible]