

Durham Catholic District School Board

Energy Conservation and Demand Management Plan 2018-19 – 2022-23

June 25, 2019

Mission/Commitment Statement

Our Mission

We are called to celebrate and nurture the God-given talents of each student as we serve with excellence in the light of Christ.

Our Vision

Each student in our Catholic learning community embodies excellence and equity by embracing the Ontario Catholic School Graduate Expectations - to be:

- a discerning believer;
- an effective communicator;
- a reflective, creative and holistic thinker;
- a self-directed, responsible lifelong learner;
- a collaborative contributor;
- a caring family member; and
- a responsible citizen.

The Durham Catholic District School Board is committed to continuing its current energy conservation practices and seeks opportunities to further energy conservation goals. The Board works with the environmental curriculum (e.g. EcoSchools) to provide environmental opportunities to students that enhance their contribution to reducing energy and water use and overall environmental footprint. These objectives will help us align with the corporate strategy Discovery 2023: Renewing the Vision strategic plan.

Goals and Objectives

The Board has established the following goals and objectives for the five-year plan:

- Engage students through the EcoSchools program and environmental curriculum
- Educate and engage staff on environmental programs
- Leverage new, innovative technology later in five-year plan to obtain deeper savings through higher efficiency equipment
- Continue preventative maintenance program, engage site operational custodial staff as well as board maintenance and IT staff

Targets

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

Annual Energy Intensity Conservation Goals

| Annual Energy Intensity Conservation Goal | Fiscal Year | | | | |
|---|-------------|---------|---------|---------|---------|
| | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 |
| ekW/ft ² | 0.46 | 0.45 | 0.43 | 0.42 | 0.41 |
| % decrease | 3 | 3 | 3 | 3 | 3 |

Five Year Energy Intensity Conservation Target

| Energy Intensity Conservation Target* | FY2017-2018 (baseline) | FY2022-2023 |
|---------------------------------------|------------------------|-------------|
| ekWh/ft ² | 15.33 | 13.16 |
| % decrease | - | 14.1 |

* Energy intensity values are weather normalized to baseline FY 2013 to properly compare years.

Managing Energy at DCDSB

Introduction

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's received for each of the five years covered by their plan.

Standards

DCDSB will be developing a Standard Operating Procedures document that will allow for better management of the daily operations of facility HVAC equipment. It will describe the operating setpoints, schedules and sequences of HVAC equipment during all seasons. These metrics will also take into account occupied and unoccupied space guidelines and metrics to help ensure the most efficient operation of equipment while maintaining sufficient comfort levels in our facilities.

Consideration will be given to developing standards and guidelines for IT and other equipment.

Financing

Financing for energy conservation projects will continue through the Ministry and any available incentives.

Roles and Responsibilities

Energy Manager

The Manager, Custodial and Maintenance has the role of energy manager at the Board. This is one of his many responsibilities and so he relies on members of the Energy Committee to help the board achieve its energy conservation objectives.

Energy Committee

The energy committee is a newly formed group that is comprised of people from several departments such as:

- Senior administration
- Energy manager
- Operations/maintenance
- Teachers, principals

- Student council
- IT

They have influence on energy consumption and are engaged in achieving the goals and objectives of this plan. The committee will meet on a regular basis and be involved in activities like:

- participating in energy management planning, and refining 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 plan
- monitoring, evaluating and reporting on energy and water use performance across board portfolio

Projects/Measures

Design/construction/retrofit

The Board strives to use higher energy efficiency standards when designing new construction. While limited Ministry capital funds make this more challenging, the Board will make every effort to design to as high a level as possible.

Some of the key retrofit projects planned for the five-year period are the following:

- LED lighting retrofits
- Complete BAS upgrades to 100% of schools from current 95%
- Continue boiler replacements at 1-2 per year
- Other projects & initiatives determined annually

Other projects and initiatives will be identified on an annual basis by the Manager, Custodial and Maintenance. He will seek input from the Energy Committee and review capital renewal requirements.

For end-of-life equipment replacement, the Board selects the highest efficiency option feasible.

Operations and maintenance

The Board will use its building automation systems to optimize its equipment operation. It has trained its custodial staff in Building Environmental Systems to help keep its facilities operating at a high level.

Occupant behaviour

Through its 100% participation in the EcoSchools program, the Board will use this solid foundation to raise awareness and further engage its students, teachers and principals on reducing energy and water use in their schools.

Renewable energy

The Board is not planning any new renewable projects at this time. It will review opportunities in the future to use renewable energy to offset electricity costs or gain other benefits as technologies and market conditions change.

Energy Procurement

DCDSB participates in a consortia arrangement to purchase electricity and other related services through the OECM's Strategic Electricity Management and Advisory Services program.

The Board also participates in a consortia arrangement to purchase natural gas through the CSBSA (OECM) Consortium.

Demand Management

DCDSB has chillers for air conditioning its secondary schools. These significantly increase the monthly demand charges for the Board so it manages the start-up of the chillers as tightly as possible, particularly when close to a month end. It tries to delay start-up at the end of a month, like May, so as to prevent large demand charges for the entire month.

Tracking & Reporting

There is currently minimal real-time monitoring of energy or water consumption of facilities, but it is not used to its full capacity. Monthly consumption data is collected from utility bills and managed through the Utility Consumption Database (UCD) operated by the Ministry of Education on behalf of all boards. The UCD contains valuable reporting information that is being used to determine relative performance by facility across the portfolio, including benchmarking at the electricity and natural gas level. This information helps the energy manager prioritize projects and initiatives to reduce energy and water consumption. Once the major conservation opportunities have been identified and addressed then the use of more granular data, such as provided by real-time monitoring systems, can be considered.

The energy manager reviews utility data on a monthly and annual basis as part of monitoring consumption across the portfolio.

Programs

DCDSB is one of the only boards across the province to have 100% participation in the EcoSchools program. This program will be the foundation for deeper engagement of students and staff at each school on energy and water conservation initiatives.

Review of Progress and Achievements in the Past Five Years: FY 2012-13 – FY 2017-18

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 | 57 | 59 | 2 |
| Total Number of Portables/Portapaks | 255 | 355 | 100 |
| Total Floor Area | 2,876,249 | 2,869,238 | -7,011 |
| Average Operating Hours | 77 | 77 | 0 |
| Average Daily Enrolment | 19,781 | 19,546 | -235 |

Energy Consumption Data

The chart below lists the “metered” consumption values in the common unit of ekWh.

| Utility | Fiscal Year 2012-13 (Baseline) | Fiscal Year 2017-18 (Current) |
|--------------------------|---|--|
| Total Electricity (kWh) | 20,145,360 | 20,486,740 |
| Total Natural Gas (ekWh) | 24,236,580 | 25,341,600 |

Notes:

- 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.
- Comparing energy consumption values from one year to another requires the use of weather normalized values as they take into consideration the impact of weather on energy performance consumption across multiple years.

| Weather Normalized Values | Fiscal Year 2012-13 (Baseline Year) | Fiscal Year 2017-18 (most recent available data) |
|----------------------------------|--|---|
| Total Energy Consumed (ekWh) | 43,183,710 | 44,005,170 |
| Energy Intensity (ekWh/ft2) | 15.01 | 15.33 |

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 over the five years to FY 2017-2018.

| Fiscal Year | Conservation Goal | | Actual Energy Savings | |
|--------------------|-------------------|-----|-----------------------|------|
| | ekWh/ft2 | % | ekWh/ft2 | % |
| 2013-14 to 2017-18 | 1.42 | 9.5 | -0.32 | -2.2 |

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

| | | (ekWh/ft2) | Variance % |
|-----------------|--|------------|------------|
| 2014 Board Plan | Forecasted Cumulative Energy Intensity Conservation Goal FY 2013-14 to FY 2017-18 | 1.42 | |
| | Forecasted Cumulative Energy Intensity Conservation Goal as a Percentage | | 9.5 |
| FY 2017-18 | Actual Cumulative Energy Intensity reduced between FY 2013-14 to FY 2017-18 - weather normalized | -0.32 | |
| Variance | 2014 Forecasted Cumulative Conservation Goal and Actual Cumulative Energy Intensity reduced - weather normalized | -1.74 | |
| | % of Cumulative Energy Intensity Conservation Goal Achieved - weather normalized | | -23 |

The small increase in energy intensity from FY 2013 to FY 2018 is primarily due to growth within the school board and a decision to include full air conditioning in all new schools.

Energy Efficiency Measures Implemented from FY 2012-13 to FY 2017-18

| SCHOOL | PROJECT | APPROX COST | YEAR |
|----------------------|------------------------------------|---------------|---------|
| Father Leo J. Austin | Window Replacement | \$ 90,000.00 | 2012-13 |
| John XXIII | Rooftop - HAVAC Replacement | \$ 85,000.00 | 2012-13 |
| John XXIII | Rooftop - HAVAC Replacement | \$ 65,000.00 | 2012-13 |
| Msgr. John Pereyma | New Air Conditioning System | \$ 85,000.00 | 2012-13 |
| Msgr. John Pereyma | Boiler Replacement | \$ 220,000.00 | 2012-13 |
| Msgr. John Pereyma | Building Automation System Upgrade | \$ 215,000.00 | 2012-13 |
| St. Elizabeth Seaton | BAS & Valves Upgrades | \$ 100,000.00 | 2012-13 |

| | | | |
|-------------------------------|-------------------------------------|---------------|---------|
| St. John the Evangelist | Boiler Replacement | \$ 109,634.00 | 2012-13 |
| St. Wilfrid | BAS & Valves Upgrades | \$ 110,000.00 | 2012-13 |
| System | High-Bay Lighting to LED | \$ 50,000.00 | 2012-13 |
| Paul Dwyer | Roof replacement | \$ 910,000.00 | 2013-14 |
| St Bernard | Boiler Replacement | \$ 150,000.00 | 2013-14 |
| St Isaac | Rooftop HVAC replacement | \$ 35,000.00 | 2013-14 |
| St John Bosco | Roof replacement | \$ 80,000.00 | 2013-14 |
| St Jude | Rooftop HVAC replacement | \$ 35,000.00 | 2013-14 |
| John XXIII | Rooftop - HAVAC Replacement | \$ 200,000.00 | 2013-14 |
| Msgr. Philip Coffey | Roof Replacement | \$ 170,000.00 | 2013-14 |
| MSGR. P. DWYER | AHU REPLACEMENT | \$ 65,000.00 | 2014-15 |
| ST. HEDWIG | RTU REPLACEMENT | \$ 65,000.00 | 2014-15 |
| ST. PAUL | ROOF REPLACEMENT | \$ 345,000.00 | 2014-15 |
| ST. JUDE | BOILER REPLACEMENT | \$ 163,100.00 | 2015-16 |
| CEC Conference Centre | Roof Replacement | \$ 163,500.00 | 2015-16 |
| Good Shepherd | Restore Roof | \$ 340,900.00 | 2015-16 |
| St. Elizabeth Seton | Roof Replacement (Partial) | \$ 85,000.00 | 2015-16 |
| St. Isaac Jogues | Replace Boilers* | \$ 113,984.00 | 2015-16 |
| St. Isaac Jogues | Roof Replacement | \$ 292,000.00 | 2015-16 |
| St. James | Roof Replacement | \$ 745,500.00 | 2015-16 |
| Catholic Education Centre | Boiler Replacement (CEC-2) | \$ 120,000.00 | 2016-17 |
| Father Leo J Austin CSS | Replace RTU - Cafeteria | \$ 75,800.00 | 2016-17 |
| Father Leo J Austin CSS | Roof Replacement (Partial) | \$ 730,000.00 | 2016-17 |
| Monsignor John Pereyma CSS | LED Lighting Retrofit | \$ 40,000.00 | 2016-17 |
| Monsignor John Pereyma CSS | Replace RTU - Office | \$ 47,400.00 | 2016-17 |
| St. Bernard CS | Replace Cooling systems and RTU | \$ 52,000.00 | 2016-17 |
| St. Elizabeth Seton CS | Roof Replacement (Partial) | \$ 85,000.00 | 2016-17 |
| St. Elizabeth Seton CS | LED Lighting Retrofit | \$ 30,000.00 | 2016-17 |
| St. Elizabeth Seton CS | Replace Exterior Lights | \$ 30,000.00 | 2016-17 |
| St. Isaac Jogues CS | Replace RTU - Office | \$ 50,000.00 | 2016-17 |
| St. Leo CS | Replace Boilers | \$ 147,680.00 | 2016-17 |
| St. Luke the Evangelist CS | Restore Roof (10320-1) | \$ 320,000.00 | 2016-17 |
| St. Matthew the Evangelist CS | Replace RTU - Gymnasium | \$ 50,000.00 | 2016-17 |
| St. Monica CS | Replace Boilers | \$ 150,000.00 | 2016-17 |
| St. Patrick CS | Replace RTU - Office and Daycare | \$ 75,000.00 | 2016-17 |
| Archbishop Denis O'Connor CHS | Replace Library and Cafeteria RTU's | \$ 80,000.00 | 2017-18 |

| | | | |
|-------------------------------|---------------------------|---------------|---------|
| Father Leo Austin CSS | Replace child care RTU | \$ 35,000.00 | 2017-18 |
| St. Andre Bessette CS | Replace Boiler | \$ 120,000.00 | 2017-18 |
| St. Andre Bessette CS | BAS Upgrade | \$ 110,500.00 | 2017-18 |
| St. Bridget CS | BAS Upgrade | \$ 85,000.00 | 2017-18 |
| St. Hedwig CS | Replace Boiler | \$ 90,000.00 | 2017-18 |
| St. John the Evangelist CS | Replace 3 RTU's | \$ 120,000.00 | 2017-18 |
| St. Joseph (Uxbridge) CS | Replace RTU's | \$ 45,000.00 | 2017-18 |
| St. Joseph CS | BAS Upgrade | \$ 110,500.00 | 2017-18 |
| St. Luke the Evangelist | BAS Upgrade | \$ 110,500.00 | 2017-18 |
| St. Mary CSS | LED Lighting Retrofits | \$ 140,000.00 | 2017-18 |
| St. Matthew the Evangelist CS | Roof replacement | \$ 806,000.00 | 2017-18 |
| St. Matthew the Evangelist CS | LED Lighting Retrofits | \$ 46,000.00 | 2017-18 |
| St. Teresa of Calcutta CS | Restore Roof (10318-1) | \$ 396,500.00 | 2017-18 |
| St. Theresa CS (Whitby) | Replace Boilers (9695-2) | \$ 131,040.00 | 2017-18 |
| St. Theresa CS (Whitby) | Roof replacement (9695-1) | \$ 453,000.00 | 2017-18 |

Senior Management Review

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

Scott Grieve

June 25, 2019

Scott Grieve

Date

Manager, Custodial and Maintenance

Facilities Services

Durham Catholic District School Board