



REPORT TO

CORPORATE SERVICES, STRATEGIC PLANNING AND PROPERTY COMMITTEE

2019-2023 TCDSB ENERGY CONSERVATION AND DEMAND MANAGEMENT PLAN (ALL WARDS)

*“I can do all things through Him who strengthens me.”
Philippians 4:13 (NRSVCE)*

Created, Draft	First Tabling	Review
April 30, 2019	June 6, 2019	
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RECOMMENDATION REPORT

Vision:

At Toronto Catholic we transform the world through witness, faith, innovation and action.

Mission:

The Toronto Catholic District School Board is an inclusive learning community uniting home, parish and school and rooted in the love of Christ.

We educate students to grow in grace and knowledge to lead lives of faith, hope and charity.



Rory McGuckin
Director of Education

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Associate Director of Facilities,
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Development, and
Chief Financial Officer

A. EXECUTIVE SUMMARY

This report recommends that the Board approve the 2019-2023 Energy Conservation and Demand Management (ECDM) Plan, included as Appendix A, as required by Ontario Regulation 507/18 under the Electricity Act.

The ECDM Plan recommends the following measures to achieve an 11% reduction in energy use over five years in all Board facilities with respect to the baseline year of 2017-2018:

- Targeted investment into the Board's highest savings potential schools to implement energy retrofits;
- Enhanced energy performance monitoring and reporting system;
- Enforcement of established board-wide operating standards such as temperature set points and ventilation operating times;
- Implementation of board-wide energy-efficient design and commissioning standards;
- Staff and stakeholder engagement – education, communication and recognition.

With an investment of \$9.46M in energy retrofits over five years, plus an annual expenditure of approximately \$300,000 for analytic, coordination and engagement resources, the ECDM Plan predicts a savings in energy costs of \$23.9M after ten years. Potential utility company incentives of \$1.5M would result in total savings after ten years of \$25.4M, netting a surplus of \$12.9M.

This report further recommends approval of the implementation of a five-year facility energy retrofit program as recommended by the 2019-2023 ECDM Plan, with an allocation of \$2M per year in the School Renewal Plan, subject to availability of funding, in order to achieve the energy cost savings outlined in the Plan.

The cumulative staff time required to prepare this report was 26 hours.

B. PURPOSE

1. As per *Ontario Regulation 507/18* under the *Electricity Act, 1998*, on July 1, 2019, and every five years thereafter, every public agency is required to

prepare and publish on its website and intranet site an energy conservation and demand management plan.

2. An energy conservation and demand management plan is composed of two parts as follows:
 - i. *A summary of the public agency's annual energy consumption and greenhouse gas emissions for its operations.*
 - ii. *A description of previous, current and proposed measures for conserving and otherwise reducing the amount of energy consumed by the public agency's operations and for managing the public agency's demand for energy, including a forecast of the expected results of current and proposed measures.*

C. BACKGROUND

1. ***School Boards in Ontario are required to report annually on energy consumption and to prepare and publish an energy conservation and demand management plan every five years.*** This requirement came into place under the *Green Energy Act, 2009*, with the first energy management plans required by 2014. The Board approved TCDSB's initial Energy Conservation and Demand Management (ECDM) Plan on June 5, 2014.
2. ***TCDSB's new ECDM Plan for 2019-2023 must be submitted and published on the Board website by July 1, 2019.*** The *Green Energy Act, 2009*, was repealed on January 1, 2019, however the requirements for broader public sector energy planning and reporting by Ontario agencies were carried over into the new *Ontario Regulation 507/18* enacted January 1, 2019, under the *Electricity Act, 1998*.
3. ***In addition to annual reporting, Board Energy Management staff have implemented the 2013-2018 ECDM Plan by:***
 - Setting energy targets;
 - Closely monitoring the Board's electricity, natural gas, and water consumption independently by using monthly utility bill data by facility;
 - Investigating any unexpected increase or decrease against historical data and to verify billing accuracy;
 - Prioritizing energy upgrades and retrofits in Renewal work;

- Managing the installation of solar photovoltaic panels under incentive programs;
 - Aligning Capital design standards with the ECDM Plan;
 - Creating a framework to support energy use reduction propositions;
 - Conducting periodic review of utility budgets and year to date costs,
 - Monitoring natural gas price signals to identify if there is a need to hedge.
4. ***An energy management specialist was retained to prepare the Board's new five-year ECDM Plan.*** Enerlife Consulting Inc. was retained in July 2018 through a competitive Request for Proposal process. Working with Board Energy Management staff, Enerlife carried out analyses of the results of the Boards 2013-2018 ECDM Plan, current energy use data, the energy use reduction potential of all Board facilities, the cost of the highest potential energy use reduction measures, potential savings over a ten-year period, the payback period and internal rate of return.

D. EVIDENCE/RESEARCH/ANALYSIS

1. ***TCDSB achieved an energy use reduction of 2% from 2013 to 2018.*** While over \$40M was invested into replacement of chillers, boilers, other HVAC equipment and lighting, priority was given to systems reaching the end of their life, where energy savings were not a primary consideration. This also reduced funds available for implementation of other planned energy conservation measures. Energy savings have not yet been fully realized from conservation measures that were carried out towards the end of the five-year period.
2. ***Adjusting indoor temperatures outside of Board-approved set points has played a role in limiting the energy savings realized over the past five years.*** The Board has an approved indoor temperature set point policy of 22°C in the heating season and 25°C in the cooling season. This indoor temperature policy has often been overridden in response to occupant comfort concerns. Centralized control of temperature is not possible where heating and cooling equipment is not connected to a Building Automation System (BAS).
3. ***Lessons learned from the results of the previous Plan have informed the development of the new ECDM Plan which has a goal to reduce energy use by 11%.*** Targeted investment into the Board's highest savings potential schools is recommended to achieve a reduction of 11% in energy use over five

years with the best return on investment. Planned improvements prioritize operational efficiencies and management systems for long-term maintenance of savings. All of the Board's capital renewal projects need to include energy efficiency as a priority consideration and all new school construction projects must establish high-performance energy efficiency standards.

4. ***40 Board facilities have been selected for energy efficiency project implementation, based on their overall energy savings potential.*** Projects will include LED lighting conversions, ventilation system testing and refurbishment, new and upgraded BAS and building envelope sealing (caulking and weatherstripping). These measures are anticipated to result in savings of \$2.2M per year in utility costs at today's rates.
5. ***An investment of \$12.5M over ten years is anticipated to result in accumulated savings after ten years of \$23.9M.*** Project costs are estimated at \$9.46M for energy retrofits over five years. Ongoing expenditures of approximately \$300,000 per year are required for analytic, coordination and engagement resources. With potential utility company incentives of \$1.5M and predicted utility cost increases, the total anticipated savings is \$25.4M after ten years, fully repaying all costs incurred and yielding a net balance of \$12.9M.
6. ***Staff and stakeholder engagement and energy use monitoring are essential components of the ECDM Plan.*** The Plan recommends:
 - Implementation of a BAS Control Centre and Energy Monitoring and Tracking Data Centre;
 - Implementation of board-wide commissioning standards;
 - Enforcement of established board-wide operating standards such as temperature set points and ventilation operating times; and
 - Promotion of energy awareness and environmental stewardship amongst all stakeholders.

E. METRICS AND ACCOUNTABILITY

1. ***An energy performance reporting system will be developed to monitor the results of the ECDM Plan.*** This will include:
 - Monthly and weekly (interval meter) reporting of actual savings for the selected buildings throughout the implementation period;

- Quarterly reporting of savings and increases for all buildings and Board-wide net energy, utility cost and greenhouse gas emissions reductions;
 - Annual reporting to senior management of overall progress compared to baseline and targets.
2. ***The energy consumption of all Board facilities is reported to the Ministry annually and published on the Board website.*** In accordance with *Ontario Regulation 507/18* under the *Electricity Act, 1998*, the Board’s Energy Management Supervisor tracks the electricity and gas consumption and greenhouse gas emissions of all facilities daily and compiles the required annual report. This information for the 2017-2018 school year is included as ‘Appendix A’ of the appended ECDM Plan (Appendix A).
 3. ***TCDSB’s Maintenance and Energy Management department is in the process of installing a real-time electricity use monitoring system.*** This system will provide the necessary energy consumption data in real time to generate an energy alarm to indicate any school above the normal baseline. Notifications of unusual consumption spikes will be sent to alert staff so that appropriate action can be taken. The provision of screens with electricity use “dashboards” within schools for staff and students to view will be explored once the system is fully implemented. The system also has the capacity to be expanded to include gas and water usage monitoring.

F. IMPLEMENTATION, STRATEGIC COMMUNICATIONS AND STAKEHOLDER ENGAGEMENT PLAN

1. ***The 2019-2023 TCDSB ECDM Plan is required to be signed by an executive officer of the Board and published on the Board’s website and intranet site by July 1, 2019.*** The Plan is included as Appendix A of this report.
2. ***The ECDM Plan involves multiple projects requiring extensive analytics, coordination and engagement.*** The first step will be to decide on the project timelines and create the resourcing plan to support it. Recommended projects will first be cross referenced with the Ministry Building Condition Database and the School Renewal Plan to determine which projects are already planned. It will likely be necessary to retain a Project Manager to develop a scope of work from the general recommendations for the 40 schools listed in the Plan and to manage the implementation.

3. ***Funds must be committed to the ECDM Plan for energy savings to be realized, with an estimated payback period of 4.8 years.*** A minimum funding commitment of \$2M per year from the School Renewal Grant and/or School Condition Improvement Grant over five years, for a total of \$10M, is recommended. A review of internal staff resources and equipment required will be part of the annual budget process.
4. ***The ECDM Plan is a step towards the Board's stated goal of Net Zero Energy.*** In March 2016, the Corporate Services, Strategic Planning and Property Committee approved a resolution to become a Net Zero Energy school board. In December, 2017, The Research in Architecture Studio was retained to conduct a study to develop a "road map" towards Net Zero, including:
 - which design or procedural strategies have the greatest potential to deliver value;
 - whether it is technically feasible to offset all energy used in schools with renewable energy; and
 - how to prepare specific projects to take advantage of external funding support, should it materialize.

A report and presentation anticipated for the September 2019 Corporate Services, Strategic Planning and Property Committee will outline the findings from this study.

5. ***Promotion of energy awareness and environmental stewardship amongst all stakeholders is key to the success of the ECDM Plan.*** The Board's Environment Committee along with the Communication Department will be engaged to develop an education and engagement program that includes trustees, senior staff, students, school staff and parents. Progress reporting to custodial and maintenance staff, team training in energy metrics and building specific opportunities and recognition of success will be implemented to engage staff.
6. ***Implementation of board-wide energy-efficient design and commissioning standards is needed.*** TCDSB's Energy Management staff will continue to work with Renewal and Capital departments to review designs and construction documents to ensure that all projects comply with the Board's energy conservation standards and look for opportunities to incorporate technology upgrades such as BAS and energy monitoring. For new schools, an opportunity for additional funding above Ministry benchmark for energy-efficient design has been provided by the latest update to the Toronto Green

Standard requiring building envelope insulation and air-tightness that exceeds the Building Code.

G. STAFF RECOMMENDATION

1. That the Board approve the 2019-2023 Energy Conservation and Demand Management (ECDM) Plan (Appendix A) as required by *Ontario Regulation 507/18* under the *Electricity Act, 1998*.
2. That a facility energy retrofit program be implemented as recommended in the 2019-2023 ECDM Plan, with an allocation of \$2M per year in the School Renewal Plan over five years, subject to availability of funding.