



**DURHAM CATHOLIC
DISTRICT SCHOOL BOARD**
Learning and Living in Faith

**Durham Catholic District School Board (DCDSB)
Energy Conservation and Demand Management Plan
2023-24 to 2027-28**

Table of Contents

DCDSB Background	5
Funding and Energy Management Planning.....	6
Asset Portfolios and Energy Management Planning.....	6
PART I: A REVIEW OF PROGRESS & ACHIEVEMENTS in the PAST FIVE YEARS... 8	
A. The Board’s Asset Portfolio	8
B. Energy Consumption Data for the Board	8
C. Weather Normalized Energy Consumption Values	9
D. Review of Previous Energy Conservation Goals and Achievements	11
Child Care Center	11
Before and After School Programs.....	12
Community Use of Schools	12
Community Hubs	12
Temporary Accommodation	12
Air Conditioning.....	13
Compliance with current Ontario Building Code (also known as OBC)	13
Pandemic.....	13
Ventilation	13
Filtration	13
E. Cumulative Energy Conservation Goal.....	15
F. Measures Implemented from Fiscal Year 2018 to 2019 to Fiscal Year 2022 to 2023	15
PART II – ENERGY CONSERVATION and DEMAND MANAGEMENT PLAN for FISCAL YEAR 2023-2024 to FISCAL YEAR 2027-28	19
Background.....	19
Energy Management Staff	19
Energy Management Strategies.....	19

A. Renewable Energy	20
B. Design/Construction/Retrofit	20
C. Operations and Maintenance	21
D. Occupant Behaviour.....	21
E. Mointoring, Tracking & Reporting	22
Future Energy Conservation Goals.....	23
Environmental Programs	24
Energy Efficiency Incentives.....	24
Energy Procurement.....	24
Demand Management.....	25
Carbon Reduction Strategies	27
Senior Management Approval of this Energy Conservation and Demand Management Plan	27

Table of Figures

Table 1: Board's Asset Portfolio	8
Table 2 & Graph 1: Metered Consumption Values	8
Table 3 & Graph 2: Asset Portfolio Chart	9
Table 4: Weather Normalized Values	10
Table 5: Cumulative Energy Intensity Conservation Goal and Actual Energy Intensity.....	11
Table 6: Childcares and Early ON program	10
Table 7: Cumulative Energy Intensity Conservation Goal from Fiscal Year 2018 to 2019 through Fiscal Year 2022 to 2023	15
Graph 3: Energy conservation projects investment and energy saving from Fiscal year 2018 to 2019 through Fiscal Year 2022 to 2023	15
Table 8: Energy conservation projects from Fiscal year 2018 to 2019 through Fiscal Year 2022 to 2023.....	15
Table 9: Summary of Energy conservation projects based on technology from Fiscal year 2018 to 2019 through Fiscal Year 2022 to 2023.....	15
Table 10 & Graph 4: Annual Energy Intensity Conservation Goals	23
Table 11: Cumulative Conservation Goal	23
Table 12 and Graph 5: Annual Carbon Reduction Goals.....	26

DCDSB Background

The Durham Catholic District School Board (DCDSB) shares a sense of community among families, educators and parishes and is committed to integrating the teachings of the Gospel with quality educational programs that guide students in their journeys to meeting the Catholic Graduate Expectations. The board currently serves approximately 22,900 students in Oshawa, Whitby, Ajax, Pickering, and the townships of Uxbridge, Scugog and Brock, in addition to thousands of adult and continuing education learners.

The Durham Catholic District School Board currently has:

- 38 elementary schools;
- 7 secondary schools;
- 6 alternative education and continuing education sites.
- 22,888 elementary and secondary students:
- 15,875 elementary students;
- 7,013 secondary/alternative education students.

Our Mission

To be an inclusive Catholic learning community that inspires every student to achieve their full potential through faith and education.

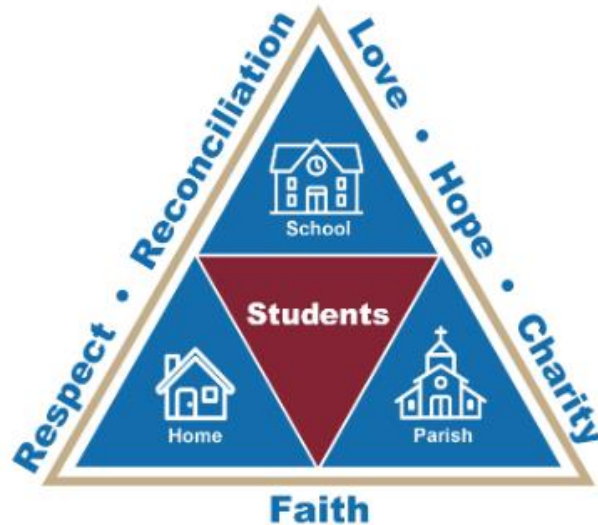
Our Vision

By fostering positive relationships with home, school, parish, and community, students and staff will learn and work in a Catholic environment where every person is:

- Safe and welcomed
- Accepted and valued
- Heard and engaged
- Supported and prepared
- Our Values
- We live our faith by demonstrating values of love, hope, faith, charity, respect and reconciliation.

Our Values

We live our faith by demonstrating values of love, hope, faith, charity, respect and reconciliation.



Funding and Energy Management Planning

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

The Ministry normally announces each Board's funding assignment around March for the next school board Fiscal Year (FY - September 1st to August 31st). The Ministry gives funding only on a year-by-year basis.

While a board may have a five-year energy management strategy, the ability to implement their strategy depends on the funding that is 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
 - 75% of the schools are built before 2000 with average Facility Condition Index (FCI) of 0.36. Remaining 25% of schools are with FCI 0.08.
 - The overall board's FCI is 0.27.
 - The Average age of the Board's buildings is 53 years.
- Building Area
 - Major additions
 - One school is leased to a private school and two buildings are leased by the board.
 - Portables
 - Installed
 - Removed
 - Areas under construction
- Equipment/Systems
 - Age
 - Type of technology
 - Lifecycle
 - Percentage of air-conditioned space
- Site Use
 - Elementary school
 - Secondary school
 - Alternative education and continuing education sites.
 - Administrative building
 - Maintenance/warehouse facility
- Shared Site Use
 - Notre Dame school shares utilities, cafeteria, and theatre with Durham District School Board.

Other Variables:

- Programs
 - Childcare
 - Before/After School Programs
 - Summer School
 - Community Use
- Occupancy
 - Significant increase or decrease in number of students
 - Significant increase in the hours of operation
 - New programs being added to a school

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	60	61	1
Total Number of Portables/Portapaks	86	108	22
Total Floor Area (ft2)	2,847,641.25	2,937,472.75	89,831.5
Average Operating Hours	77	77	0
Average Daily Enrolment	19,546	21,820	2,274
% of Total Floor Area Air Conditioned for cooling	43.7%	56.7%	13%
Number of Facilities with Mechanical Ventilation	53	53	0

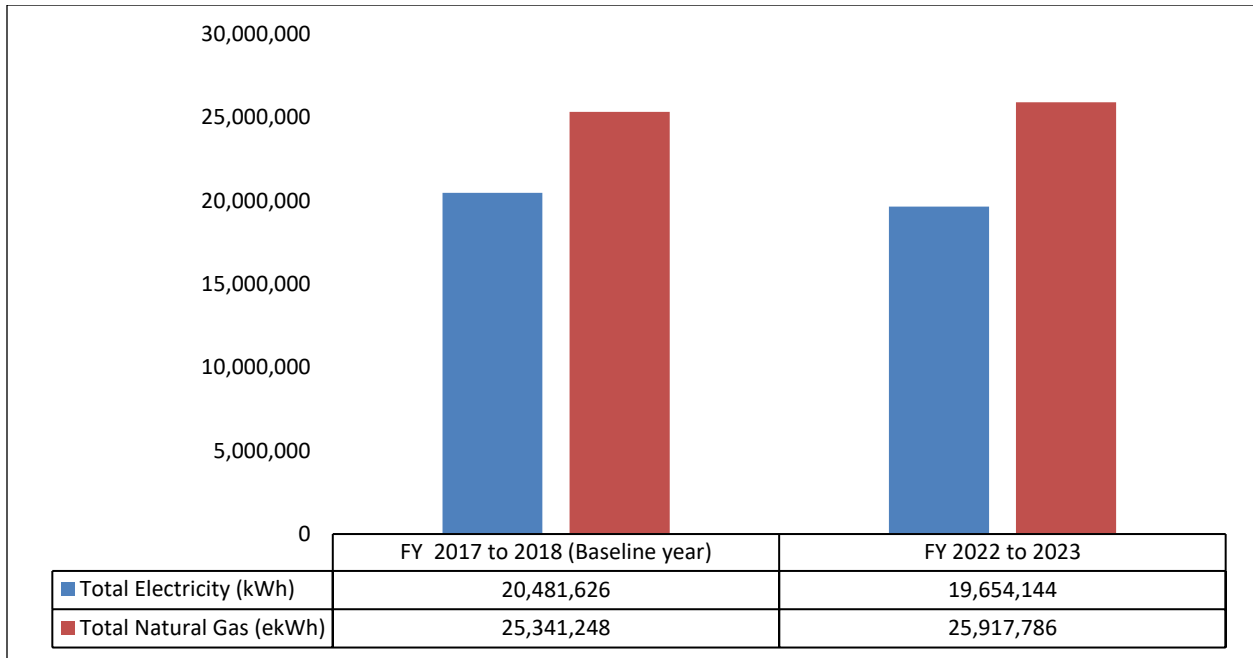
B. Energy Usage Data for the Board

The following table and graph display the “metered”¹ consumption values in the common unit of Equivalent Kilowatt Hours (ekWh) and Kilowatt Hours (kWh).

Table 2 & Graph 1: Metered Usage Values

Utility	Fiscal Year 2017 to 2018 (Baseline year)	Fiscal Year 2022 to 2023
Total Electricity (kWh)	20,481,626	19,654,144
Total Natural Gas (ekWh)	25,341,248	25,917,786

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



C. Weather Normalized Energy Consumption Values

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

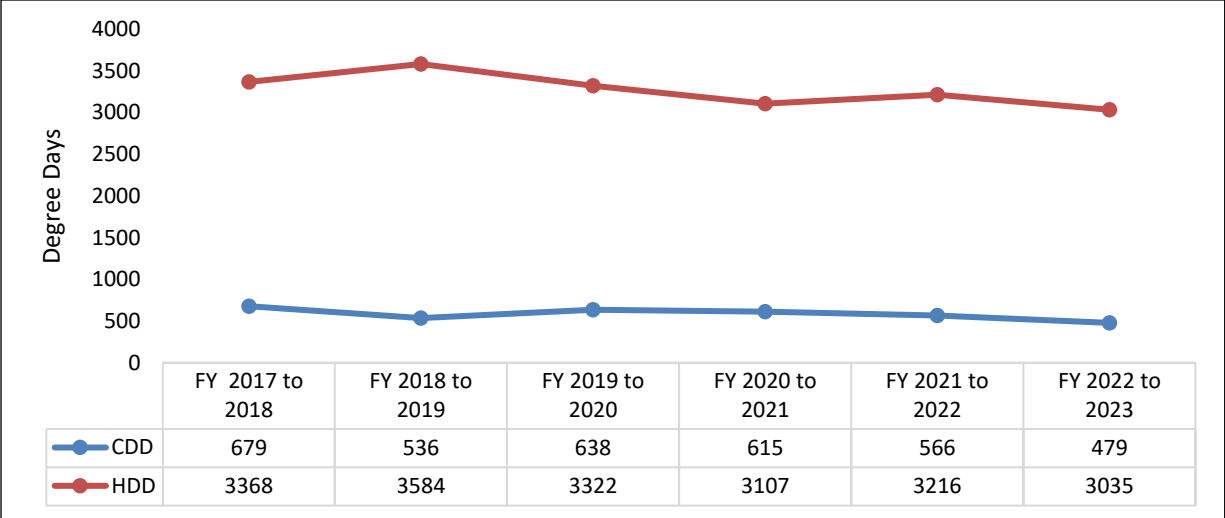
To demonstrate the effect of weather, the following table with graph shows the Weighted Average Heating Degree Days (HDD)² and Cooling Degree Days (CDD)³ for the six most common Environment Canada weather stations in the Ontario education sector.

Table 3 & Graph 2: 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	3368	3584	3322	3107	3216	3035
CDD	679	536	638	615	566	479

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.t



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
Total Energy Consumed (ekWh)	45,276,220	47,250,024
Energy Intensity (ekWh/ft2)	15.90	16.06
Total GHG Emissions (kgCO ₂)	5,132,533	5,326,587

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
Emissions Intensity (kgCO ₂ /ft ²)	1.80	1.81

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/ft ²	Conservation Goal Percentage	Actual Energy Savings ekWh/ft ²	Actual Energy Percentage
2018 to 2019	0.46	3%	0.54	3.42%
2019 to 2020	0.45	3%	1.53	9.98%
2020 to 2021	0.43	3%	-4.70	-34.00%
2021 to 2022	0.42	3%	0.28	1.52%
2022 to 2023	0.41	3%	2.18	11.97%

Childcare Center

The introduction of Childcare centers created many new spaces through new additions or major renovations of existing facilities. The result was more floor area and sometimes more energy-intensive designs due to factors such as:

- Higher ventilation requirements,
- Use of air conditioning, etc.

The Board has expanded childcare programs and early year’s (EarlyON) programs at its elementary schools significantly since 2012 to reflect the Ministry’s support for new Childcare and Early Years programs. As of the 2022-2023 school year the Board will have a total of 19 childcare centres operating in purpose-built space to offer families programming for infants, toddlers and pre-school aged children.

In addition, the Board offers programs for children and families at Ontario Early Years Centres (OEYC, now renamed EarlyOn).

Table 6: Board’s childcares and EarlyON program

Program	Fiscal Year 2017 to 2018 (Baseline year)	Fiscal Year 2022 to 2023	Increase/ Decrease (%)
Childcares	16	19	18.8%
Childcares rooms	46	81	76%
OEYC/EarlyON	2	5	150%

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.

Our five partnered childcare operators, also provide valuable before and after programs at 35 of our elementary schools in shared school spaces.

Community Use of Schools

The Ministry of Education introduced funding to all school boards, so they can make school space more affordable for use after hours. 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, increased to maximum usage. The use of these spaces during non-school hours requires a facility’s HVAC system to operate for an extended period of time on a daily basis, which will increase the overall energy intensity.

All the Board schools are used to varying degrees for Community use purposes during after school hours, weekends, holidays and in the summer.

Community Hubs

In 2016, the Ministry of Education introduced funding for boards to carry out Community Hubs within their asset portfolios. As a result, the board developed cooperative and collaborative facility partnerships which enabled the Board to improve utilization of school buildings, reduce facility costs and improve educational opportunities as well as demonstrating a willingness to collaborate with designated community partners.

Partnerships may involve co-building new facilities, leases, licenses and joint use agreements to utilize part of an existing school or administrative facility specifically during school hours.

Where a partnership is appropriate for the school setting and where it enhances student achievement, the Board is receptive to sharing facilities for the use of unoccupied space in existing schools and administration facilities. A good example of a partnership that is mutually beneficial to the school, community and partner, is with Grandview Kids, an independently operated not-for-profit organization. They are the only Children's Treatment Centre in Durham Region, providing specialized programs, outpatient clinical treatment and support to thousands of children and youth with physical, communication and developmental needs and their families. We have shared and discreet spaces with Grandview Kids in St. Leo CS and Monsignor Paul Dwyer CHS.

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 hours on weekends. The use of these spaces during non-school hours requires a facility's HVAC and electrical systems to operate for an extended period of time on a daily basis, which will increase the overall energy intensity.

Temporary Accommodation

The Board has increased the total inventory of portable classrooms in use at its sites from 86 portables in 2017- 2018 to 108 portables in 2022- 2023. Portables are equipped with technology, heating & cooling to meet improved ventilation, and lighting. These portables have very limited control of energy systems during non-occupancy and holidays which increases energy usage.

Air Conditioning

Historically, schools have not had air conditioning, or it has been in limited spaces in the facilities. However, with climate change, "shoulder seasons" such as May, June and September are experiencing higher than normal temperatures. Communities are demanding that schools have air conditioning. Air conditioning significantly increases a facility's energy use, specifically the electricity consumption. The board developed a standard to provide air conditioning for all the new schools, and when retrofitting mechanically systems, air conditioning is added where feasible.

The air conditioning space for the board has been increased by 30% from the baseline year of FY 2018.

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

When renovations or an addition is built onto an existing school, equipment such as HVAC systems, lighting etc., may be required to meet up-to-date 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 values, 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.

The prolonged and ongoing effects of the pandemic caused increases of approximately 20% total energy consumption in FY 2021 when compared with pre-pandemic FY2019.

Ventilation

Based on ASHRAE recommendations, the Ministry of Education increased ventilation rates, and operating hours to promote better air quality to reduce infection rates during the pandemic. The board implemented 100% fresh air circulation through all the HVAC units, removing recirculation, changing minimum outdoor setting, and increasing the operating hours of HVAC units. Increased ventilation rates and longer operating hours have been reduced from the pandemic period, but are still in effect, and have significantly increased the natural gas consumption by approximately 5% when compared to pre-pandemic conditions. During the pandemic and through to the 2023-2024 school year, various ventilation adjustments were made that were different from the pre-pandemic settings that increased the natural gas by 28% in FY2021 & 25% in FY 2022.

Filtration

The board implemented 1200 standalone HEPA filtration units as part of the Provincial response to the pandemic which also increased energy consumption, primarily electricity, as they are plug-in units without BAS controls or timers, and therefore may operate continuously. It is estimated that these standalone HEPA units increased the board's electricity usage by 1.7% annually.

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

Cumulative Energy Intensity	(ekWh/ft2)	Variance
Forecasted Cumulative Energy Intensity Conservation Goal of Fiscal Year 2018 to 2019 through Fiscal Year 2022 to 2023	2.17	N/A
Forecasted Cumulative Energy Intensity Conservation Goal as a Percentage	N/A	14.1%
Actual Cumulative Energy Intensity Reduced or Increased from Fiscal Year 2018 to 2019 through Fiscal Year 2022 to 2023 – Weather Normalized	-0.16	N/A
Variance between 2019 Forecast Cumulative Conservation Goal and Actual Cumulative Energy Intensity– Weather Normalized	-2.33	N/A
% of Cumulative Energy Intensity Conservation Goal Achieved - Weather Normalized	N/A	-7.25%

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

The board implemented various energy efficient capital projects through Design, Construction and Retrofit, and Operations & Maintenance investments which contributed to 6.8% savings in the total energy consumptions. This savings was also achieved with Occupant behaviour changes. A list of the building system energy saving projects; the project cost; energy savings; and the fiscal year that the project was implemented are outlined below in the graph and table.

Graph 3: Energy conservation projects investment and energy saving from Fiscal year 2018 to 2019 through Fiscal Year 2022 to 2023

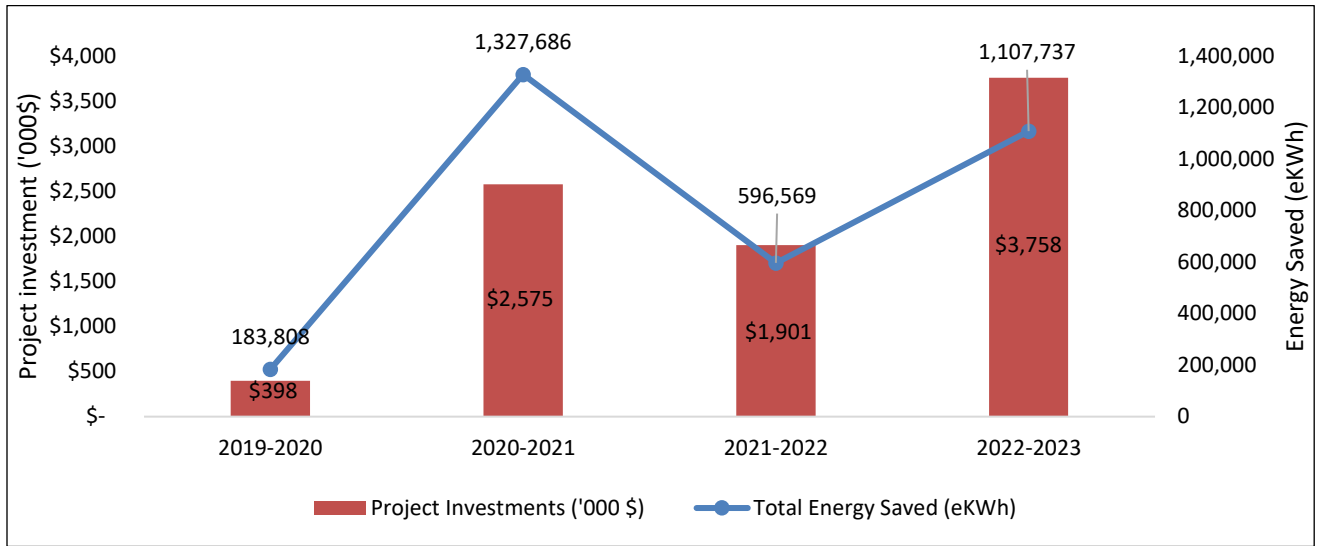


Table 8: Energy conservation projects from Fiscal year 2018 to 2019 through Fiscal Year 2022 to 2023

Location	Project	Total Energy Saved (eKWh)	Project Investments	Project Year
St Christopher	LED lighting retrofit - interior	37,056	\$ 69,075	2019-2020
St Mark the Evangelist	High Efficient Boiler Replacement	65,016	\$ 152,800	2019-2020
St John Bosco	High Efficient Boiler Replacement	81,736	\$ 176,595	2019-2020
Father Leo Austin	Chiller water system Upgrades	64,832	\$ 736,862	2020-2021
St Christopher	High Efficient Boiler Replacement	124,737	\$ 327,600	2020-2021
St Elizabeth Seton	High Efficient Boiler Replacement	216,054	\$ 354,600	2020-2021
St Matthew	High Efficient Boiler Replacement	157,489	\$ 148,300	2020-2021
St Theresa Whitby	High Efficient Boiler Replacement	54,427	\$ 293,612	2020-2021
Archbishop Denis O'Connor	LED lighting retrofit - interior	97,945	\$ 138,139	2020-2021
St Bridget	LED lighting retrofit - interior	48,967	\$ 60,035	2020-2021
St Isaac Jogues	LED lighting retrofit - interior	40,183	\$ 27,479	2020-2021
St John Boscoe	LED lighting retrofit - interior	48,634	\$ 43,822	2020-2021
St Patrick	LED lighting retrofit - interior	64,932	\$ 93,355	2020-2021

Location	Project	Total Energy Saved (eKWh)	Project Investments	Project Year
St Thomas Aquinas	LED lighting retrofit - interior	29,824	\$ 29,019	2020-2021
Father Leo Austin	LED lighting retrofit - interior	166,879	\$ 145,000	2020-2021
Monsignor Philip Coffey	LED lighting retrofit - interior	34,420	\$ 22,000	2020-2021
St Jude	LED lighting retrofit - interior	39,609	\$ 30,000	2020-2021
St Luke the Evangelist	LED lighting retrofit - interior	48,686	\$ 32,000	2020-2021
St Monica	LED lighting retrofit - interior	44,674	\$ 55,000	2020-2021
St Teresa of Calcutta	LED lighting retrofit - interior	45,393	\$ 38,000	2020-2021
OMAC	High Efficient Boiler Replacement and BAS Upgrades	137,259	\$ 304,582	2021-2022
St Catherine of Siena	High Efficient Boiler Replacement	74,628	\$ 254,840	2021-2022
All Saints	Chiller water system Upgrades	67,058	\$ 981,991	2021-2022
Notre Dame	BAS Upgrades	53,196	\$ 142,310	2021-2022
Sir Albert Love	LED lighting retrofit - interior	26,271	\$ 22,555	2021-2022
St Bernard	LED lighting retrofit - interior	36,744	\$ 37,515	2021-2022
St James	LED lighting retrofit - interior	45,362	\$ 21,731	2021-2022
St Josephine Bakhita	LED lighting retrofit - interior	54,011	\$ 46,789	2021-2022
St Mark the Evangelist	LED lighting retrofit - interior	54,803	\$ 49,118	2021-2022
St Leo	LED lighting retrofit - interior	47,237	\$ 39,461	2021-2022
652 Rossland	High Efficient Boiler Replacement	58,629	\$ 373,000	2022-2023
All Saints	BAS Upgrades and Mechanical Upgrades	52,783	\$ 965,800	2022-2023
St John 23rd	High Efficient Boiler Replacement and BAS Upgrades	250,195	\$ 890,000	2022-2023
St Patrick	Heat Recovery Unit	106,521	\$ 375,000	2022-2023
St James	High Efficient Boiler Replacement and BAS Upgrades	103,923	\$ 563,000	2022-2023
All Saints	LED lighting retrofit - interior	162,314	\$ 128,334	2022-2023
St Joseph Oshawa	LED lighting retrofit - interior	50,374	\$ 43,544	2022-2023

Location	Project	Total Energy Saved (eKWh)	Project Investments	Project Year
St Bernadette	LED lighting retrofit - interior	54,803	\$ 52,937	2022-2023
St Wilfrid	LED lighting retrofit - interior	56,543	\$ 49,453	2022-2023
St John the Evangelist	LED lighting retrofit - interior	33,972	\$ 24,044	2022-2023
Notre Dame	LED lighting retrofit - interior	163,586	\$ 149,776	2022-2023
Father Leo Austin	LED lighting retrofit - exterior	4,495	\$ 37,350	2022-2023
St Bernard	LED lighting retrofit - exterior	1,770	\$ 17,900	2022-2023
Monsignor Phillip Coffey	LED lighting retrofit - exterior	1,879	\$ 30,520	2022-2023
St Luke the Evangelist	LED lighting retrofit - exterior	3,015	\$ 24,000	2022-2023
St Monica	LED lighting retrofit - exterior	2,937	\$ 33,600	2022-2023
Total		3,215,800	\$ 8,632,443	

Table 8: Summary Energy conservation projects based on technology from Fiscal year 2018 to 2019 through Fiscal Year 2022 to 2023

Technology	Total Energy Saved (eKWh)	Project Investments (\$)
LED lighting retrofit	1,547,316	\$ 1,591,551
Energy- Efficient Boiler Replacement	832,717	\$ 2,081,347
Chiller water system Upgrades	131,890	\$ 1,718,853
Energy- Efficient Boiler Replacement and BAS Upgrades	491,377	\$ 1,757,582
BAS Upgrades	53,196	\$ 142,310
Heat Recovery Unit	106,521	\$ 375,000
BAS Upgrades and Mechanical Upgrades	52,783	\$ 965,800
Total	3,215,800	\$ 8,632,443

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

Background

As part of the Board's Strategic Plan, a Stewards of Sustainability Committee was established to develop sustainability priorities to become a more sustainable school board. DCDSB uses United Nations Sustainable Development Goals (UNSDG's) as a foundational guideline to develop sustainability plans. Energy is one of the key pillars and DCDSB continues to work towards reducing annual energy consumption and carbon footprint through various sustainable energy methods and initiatives where feasible.

Board Energy Management Staff

1. Energy Management Supervisor
2. Manager of Capital and Energy
3. Sustainability Committee

The Manager, Capital & Energy along with Energy Management Supervisor have the role of implementing energy management practices. The Sustainability Committee consists of various staff and students from across the board who support the Manager and Supervisor achieve the boards energy conservation targets.

Energy Management Strategies

Energy management strategies fall into five key categories:

- A. Renewable Energy
- B. Design/Construction/Retrofit
- C. Operations and Maintenance
- D. Occupant Behaviour
- E. Tracking, Monitoring, and Reporting

A. Renewable Energy

Renewable energy generation can contribute to reducing DCDSB long-term energy costs and emissions. The Board does not have any approved renewable projects currently, but the board will review opportunities to use renewable energy to offset electricity costs or gain other benefits as technologies and market conditions change.

The board is also investigating a large photo-voltaic roof top solar installation as a part of the new Monsignor Paul Dwyer Catholic High School design, which could generate 300,000kWh annually and significantly reducing the carbon footprint for the school.

Other potential investigations include:

- 3 High Schools solar retrofits;
- And any new construction sites.

B. 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:

- Interior & Exterior LED retrofits including occupancy sensor and dimmers;
- Complete Building Automation Systems (BAS) upgrades to 100% of schools. Currently, there are approximately 85% of school space that are controlled by a BAS. These upgrades include replacing all pneumatic controllers with electronics controls;
- High-efficiency and/or Condensing boiler replacement projects;
- Installation of heat pumps;
- Improve the building envelop – Roof insulation (R30), Wall insulation, Energy efficient windows.
- Electric vehicles chargers.

Other projects and initiatives will be identified on an annual basis by the energy management team through the input from the sustainability committee, architects, consultants, and review capital renewal requirements.

For end-of-life equipment replacement, the Board will conduct energy assessments to review the existing condition, evaluate new technology, redesign the systems, and select the highest efficiency option, when feasible. The board will be using the Ministry designated capital assessment tool to identify and plan for energy efficient capital renewal and replacement projects.

C. Operations and Maintenance

The Board will use its building automation systems to optimize the equipment operation.

1. Develop a training plan for maintenance and custodial staff in Building Environmental Systems to help keep its facilities operating at a high level.
2. Development of a training plan for custodial staff to improve their knowledge of basic energy related preventative maintenance (PM) practices.

New procedures and best practices will be developed, and existing procedures will be reviewed to provide guidelines for the efficient operation and maintenance of energy systems.

1. Review the requirement of Standalone HEPA units.
2. HVAC MERV-13 filter replacement program.
3. Operating strategy of air conditioning during summer breaks.
4. Summer and holiday shutdown procedures.
5. Portable non-occupancy shutdown procedure.

D. Occupant Behaviour

Through participation in the EcoSchools program and Environmental education 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. The board target to is to increase the EcoSchool participation:

- Total School enrollment = 45
- Achieve Platinum Certification = 8
- Achieve Gold Certification = 25
- Achieve Bronze Certification = 5
- Achieve Participant Certification = 7

Increasing awareness and engagement across board departments in energy and water conservation practices will help reduce energy and water consumption.

Use board communication tools to improve energy awareness communication.

Initiate and support events at board offices and schools.

- Earth Hour
- Earth Week
- Water Conservation Day
- Other Energy/Environmental events.

Partnering with the Region, Municipalities, and Utility companies to participate in energy related programs and share best practices.

- Durham Greener Building program
- Energy Benchmarking Program
- Save ONEnergy - Energy Performance Program
- Community Climate Adaptation Plan
- ZEVIP Rd 4
- Others

Participate in training and awareness programs for staff.

- Certified Energy Manager Training for Supervisors
- SaveOn Energy Training Sessions
- Building Automation Systems
- Preventative maintenance

E. Monitoring, Tracking, & Reporting

There is currently minimal real-time monitoring of energy or water consumption in board facilities, and 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 school boards. The UCD contains valuable reporting information that is being used to determine relative performance by facility across the board and provincial portfolios, including benchmarking of electricity natural gas and water consumption. This information helps Board staff prioritize projects and initiatives to reduce energy and water consumption. Once simple energy conservation opportunities have been identified and implemented then more granular data, provided by real-time monitoring systems will help identify and develop further energy efficiency projects.

Board Plans include:

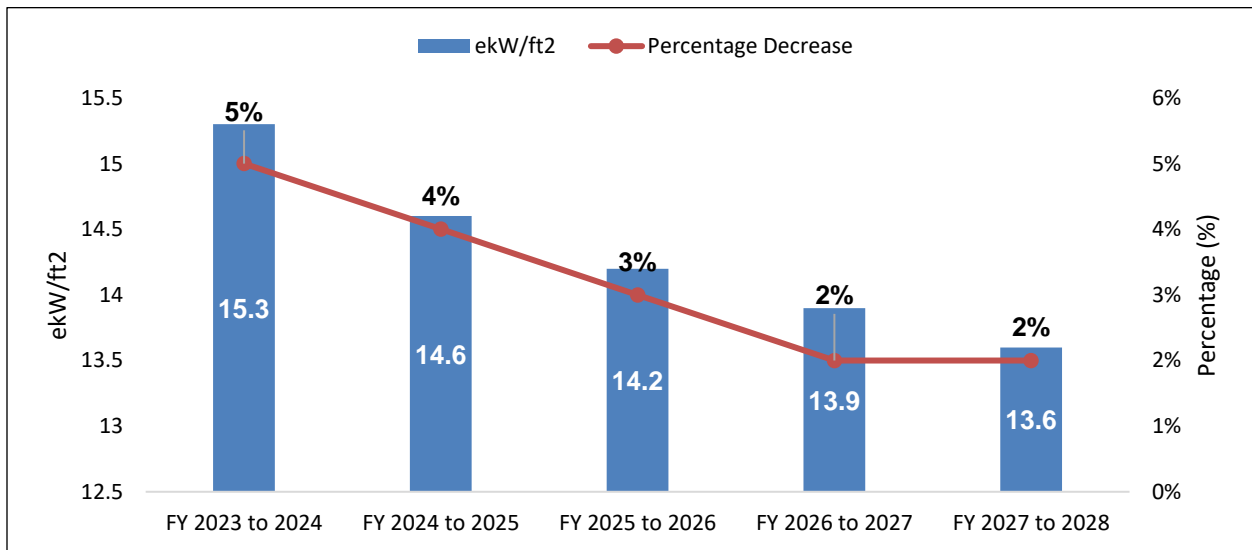
- Implementation of a real-time online portal for schools and board staff to track the energy performance at all times.
- Install and renew sub-metering with third-party monitoring systems for seven high schools to improve real-time tracking.
- Energy reporting on a quarterly and annual basis will be developed and shared with schools and board staff.

Future Energy Conservation Goals

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

Table 9 & Graph 4: 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/ft ²	15.3	14.6	14.2	13.9	13.6
Percentage Decrease	5%	4%	3%	2%	2%



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
Total ekWh/ft ² Reduction	2.4
Total Percentage Decrease	15%

If yes,

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

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

- Yes No

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:
-

Carbon Reduction Strategies

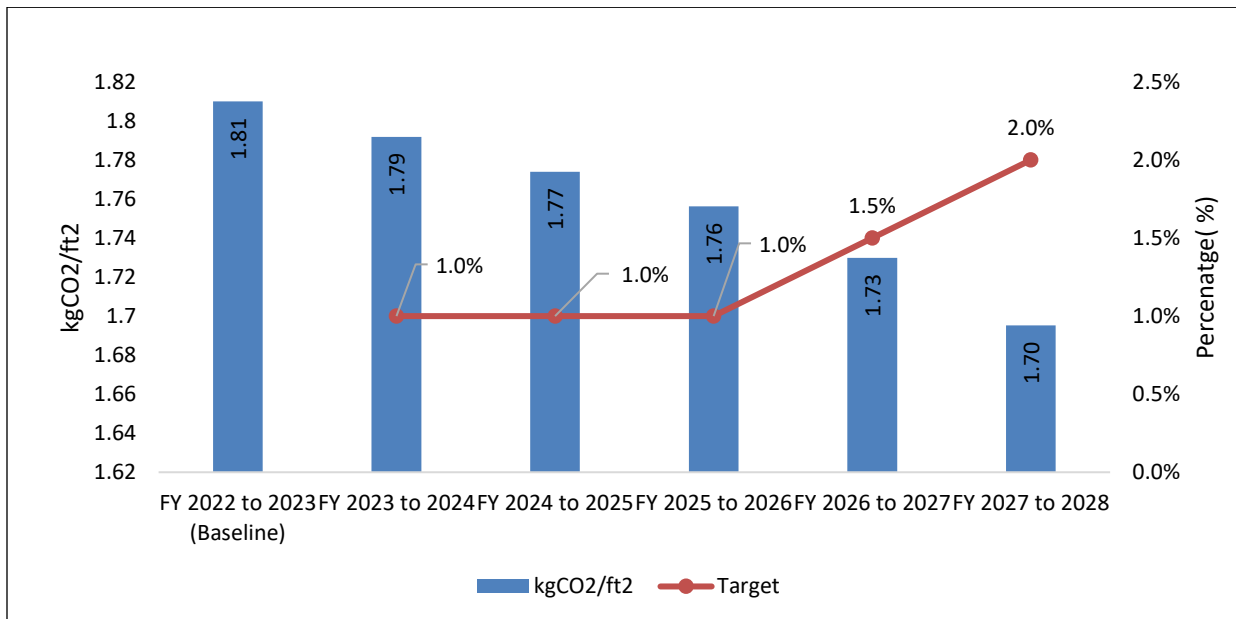
DCDSB has set a carbon reduction goal and is in the process of developing a detailed carbon reduction strategy focusing on four main pillars:

1. Energy Efficiency
2. Fuel Switching
3. Electrification
4. Renewable Energy

The table and graph below outline the carbon reduction goals of the board over the 5 years of the plan.

Table 12 & Graph 5: Annual Carbon Reduction Goals

	Fiscal Year 2022-2023 (Baseline)	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
kgCO ₂ /ft ²	1.81	1.77	1.74	1.70	1.67	1.64
Target	-	1%	1%	1.0%	1.5%	2%



Senior Management Approval of the Energy Conservation and Demand Management Plan

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

Full Name: **Scott Grieve**

Job Title: **Superintendent of Business, Finance and Facilities Services**

Date: **June 22, 2024**