

ENERGY CONSERVATION AND DEMAND MANAGEMENT PLAN



**Waterloo Catholic
District School Board**
Quality, Inclusive, Faith Based Education

Advisory Committee

Zeb Foss
Energy Conservation Supervisor

Anna Taylor
Construction and Renovations Supervisor

Terri Pickett
(Temporary) Maintenance Supervisor

Adrian Frigula
Senior Manager of Facility Services

Shesh Maharaj
Executive Superintendent of Corporate Services

Sustainable Development Committee

Under the leadership of Zeb Foss, a new Terms of Reference for this Committee has been created which identifies the following members for 2023:

- Superintendent of Learning
- Energy Conservation Supervisor
- Purchasing Officer
- Facility Services Staff (Facility Operations Supervisor Lead, Maintenance Supervisor, Building Automation Technician, Construction Supervisor)
- Chief Managing Officer
- Elementary and Secondary Administrators
- STSWR - School Travel Planning Supervisor
- Continuing Education Administrator or Designate
- Teaching Staff and / or Program Consultants
- Grand River Conservation Authority Representative
- Sustainable Waterloo Region Representative
- Other Community Partners

TABLE OF CONTENTS

- ENERGY CONSERVATION AND DEMAND MANAGEMENT PLAN 1
 - Sustainable Development Committee..... 2
 - Advisory Committee 2
- INTRODUCTION..... 4
- GUIDING PRINCIPLES 5
- GOALS AND OBJECTIVES..... 6
- LEGISLATIVE REQUIREMENTS 7
 - Ministry Reporting Requirements..... 7
- EDUCATION SECTOR BACKGROUND 9
 - Funding and Energy Management Planning..... 9
 - Building Profile of the Board..... 9
 - Energy Management Variables..... 10
- ENERGY MANAGEMENT AT WCDSB 11
 - WCDSB Energy Management Framework 11
 - Energy Consumption Data..... 12
 - Weather Normalized Energy Consumption Data..... 12
 - Review of Current and Future Energy Conservation Targets and Achievements..... 14
 - Trend over the past 8 years 16
 - Energy Management Strategies..... 18
 - Environmental Programs and Community Engagement 21
- REFERENCES AND SUPPORTING DOCUMENTS..... 22
- APPENDICES 26
 - APPENDIX A: PROFILE OF WCDSB BUILDINGS 26
 - APPENDIX C1: Planned Investments in Energy Efficiency FY2019-23 – Design, Construction, and Retrofit..... 26
 - APPENDIX C2: Planned Investments in Energy Efficiency FY2019-23 – Operations and Maintenance..... 27
 - APPENDIX C3: Planned Investments in Energy Efficiency FY2019-23 – Occupant Behaviour Strategies 27
 - APPENDIX C4: Planned Investments in Energy Efficiency FY2019-23 – Total Investments by Fiscal Year 28
 - APPENDIX D: Completed/Planned Energy Impacting Mechanical/Electrical Projects FY2022-FY2023..... 28
- Senior Management Approval of this Energy Conservation and Demand Management Plan 30

INTRODUCTION

The Waterloo Catholic District School Board (WCDSB) has a long history of environmental protection and awareness, and of innovative action toward sustainable operations. The Board's collective dedication for creating a better future for its students, staff, and community members stems from a deep appreciation of God's world.

The WCDSB Energy Conservation and Demand Management Report is written to satisfy legislative requirements as they relate to energy conservation, local commitments made to reduce greenhouse gas emissions (GHG), a need to address budget pressures and the current state of our environment, supporting the creation of a sustainable future for younger generations, and in the context of the requirements contained in the 2022-2025 [Multi-Year Strategic Plan](#).

WCDSB is actively addressing long-term sustainability in the following key areas:

- Energy & Water Conservation
 - Through energy audits, capital renewal programs, monitoring local consumption, and conducting repairs and preventative maintenance on equipment.
- Purchasing & Waste
 - Through contractual terms and conditions with vendors, social procurement programs, waste audits, recycling, and composting programs, and raising awareness around waste with students and staff.
- Buildings & Grounds
 - Through tree-planting for shading and greenhouse gas reduction, eco-friendly turf management, repairs and maintenance, and monitoring and managing building controls for efficiency.
- Food & Drink
 - Through education and awareness programs in the curriculum delivered to students, modelling desirable behaviours, and through administrative procedures providing guidelines to schools on healthy options during food days.
- Inclusion & Participation
 - Through encouraging both students and staff to be proactive in supporting ethical actions, providing training to all on EDI, being mindful of others, and acting in alignment with Catholic teachings.
- Local Well-Being
 - Through receiving feedback from students and staff, designing programs to increase physical and mental wellness while at school / work, providing central resources and materials to support wellness, and identifying and training staff experts as wellness champions.

This is in keeping with the guidance of Pope Francis in his historic encyclical, [Laudato Si' – On Care for our Common Home](#) as well as WCDSB's own mission and vision.

GUIDING PRINCIPLES

Vision

“Our Catholic Schools: heart of the community -- success for each, a place for all.”

Mission

"As disciples of Christ, we educate and nurture hope in all learners to realize their full potential to transform God's world."

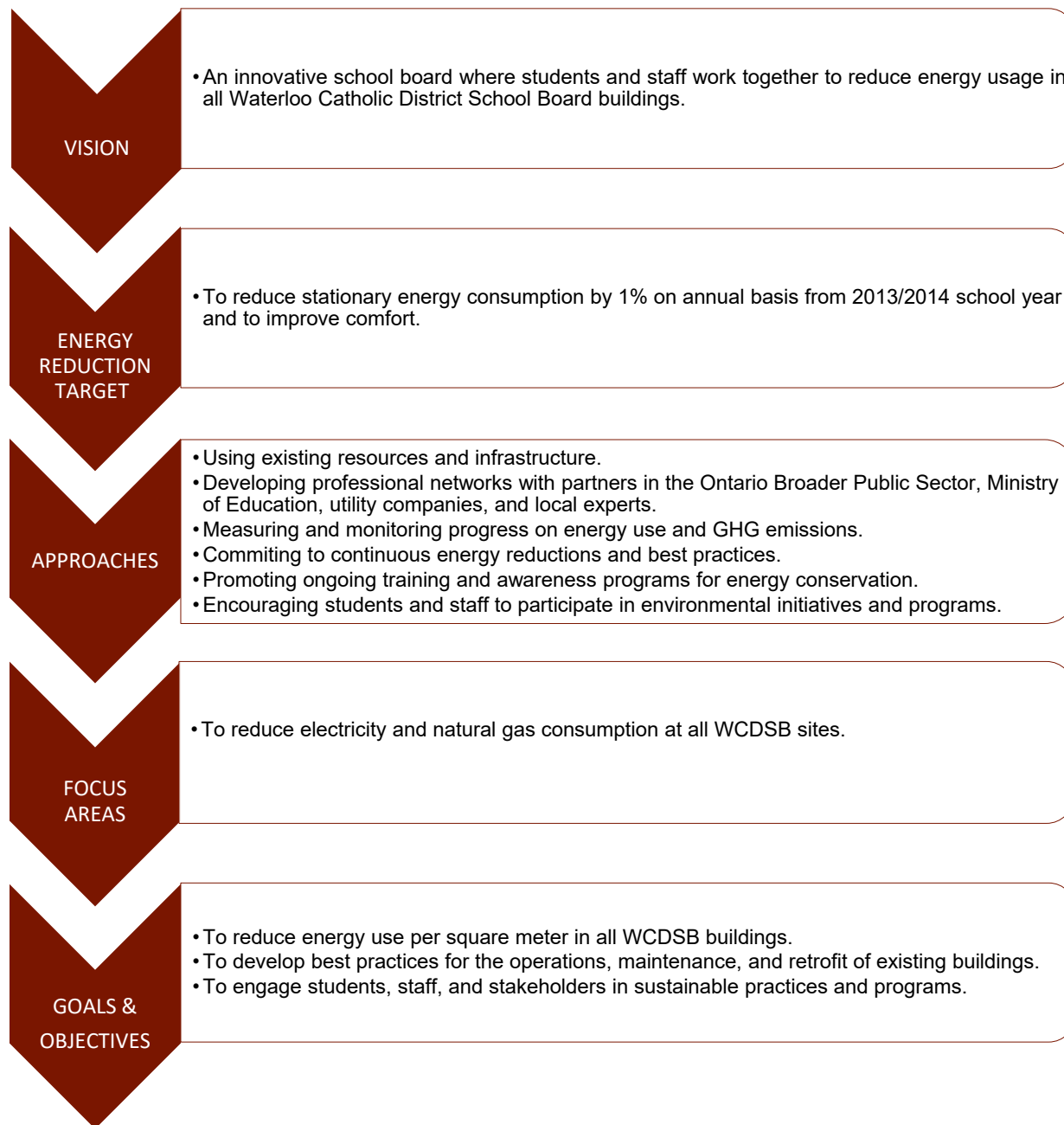
Our Beliefs

All students nurtured in a community grounded in our Gospel values, and experiencing authentic learning environments of collaboration, inquiry, and engagement, will become global citizens who transform God's world.

We maximize the God-given potential of each child when we welcome all students, believe in all students, and instill hope in all students, basing our decisions on stated priorities. In fostering students who meet the Ontario Catholic School Graduate Expectations we also produce successful and independent global 21st century learners who give witness to their faith.

GOALS AND OBJECTIVES

The goal of the Waterloo Catholic District School Board Energy Conservation and Demand Management Plan is to guide students and staff to understand the impacts of greenhouse gas (GHG) emissions and to take actions to reduce energy consumption. To meet this goal, an action plan was created using achievable energy conservation targets. These goals and objectives were influenced by and are in alignment with Board plans, policies, principles, and Catholic teachings.



LEGISLATIVE REQUIREMENTS

Ministry Reporting Requirements

Ontario Regulation 397/11 "[Energy Conservation and Demand Management Plans](#)" requires certain public agencies (municipalities, municipal service boards, schools board, universities, colleges and hospitals) to report on their energy consumption and greenhouse gas (GHG) emissions annually and to develop and implement five-year energy conservation and demand management (ECDM) plans.

Public agencies consume a large amount of energy. As an example, for year 2018-2019, Ontario school

boards spent approximately \$447.9 million on utilities: \$308.1 million on electricity, \$82.3 million on natural gas, \$3.3 million on fuel oil, \$1.9 million on other heating sources, and \$52.3 million on water and sewage costs. Centralized energy reporting helps organizations understand the use of energy at their sites. More specifically, energy reporting helps:

- Drive participation in conservation and demand management programs.
- Encourage activities to reduce energy consumption which can free up funding for core activities.
- Allow organizations to benchmark and compare the energy consumed at similar facilities across the province.
- Support the preparation of 5-year conservation and demand management plan as required under regulation.

In their [Made-in-Ontario Environment Plan](#), the Ontario Ministry of the Environment, Conservation and Parks has stated that “Ontario will reduce its [Greenhouse Gas] Emissions by 30% below 2005 levels by 2030” (Ontario Ministry of the Environment, Conservation and Parks, 2019, p. 21). The government of Canada has also committed to achieve a net-zero emissions economy by 2050 and to meet this goal, in 2020, the Government of Canada introduced the [Canadian Net-Zero Emissions Accountability Act](#) .

The institutional and commercial sectors play a significant role in reducing energy consumption and related GHG emissions.

EDUCATION SECTOR BACKGROUND

Funding and Energy Management Planning

The province announces grant allocations in the spring for the next fiscal year which runs from September 1st to August 31st. The province does not provide boards with multi-year funding allocations. As a result, while a Board may have a five-year energy management strategy, the ability to implement the strategy is dependent on receipt of sufficient funding on an annual basis. This plan uses historical and current funding levels to develop estimates of available future revenues for energy conservation work.

The two main funding sources for major energy conservation projects include the School Renewal Allocation (SRA) and School Condition Improvement (SCI) grants.

In response to the COVID-19 pandemic, both provincial and federal governments provided several capital grants to school boards to conduct repairs, replacement, enhancement, and renovations to schools where air quality could be improved. These grants, which approached \$10M between 2020 and 2022, allowed WCDSB to implement more current technologies in schools that increased efficiency, user comfort, and reduced greenhouse gas emissions.

Building Profile of the Board

The Waterloo Catholic District School Board serves over 25,000 kindergarten to grade 12 students and 15,000 adult learners in the cities of Kitchener, Waterloo, and Cambridge as well as the townships of Wilmot, Woolwich, Wellesley, and North Dumfries. The Board operates 43 elementary schools, 5 secondary schools, 3 continuing education sites, and 3 administration facilities (Appendix A). The current building stock was built between 1898 and 2021. Buildings built between 1950 and 1970 represent the largest building stock (Figure 1a).

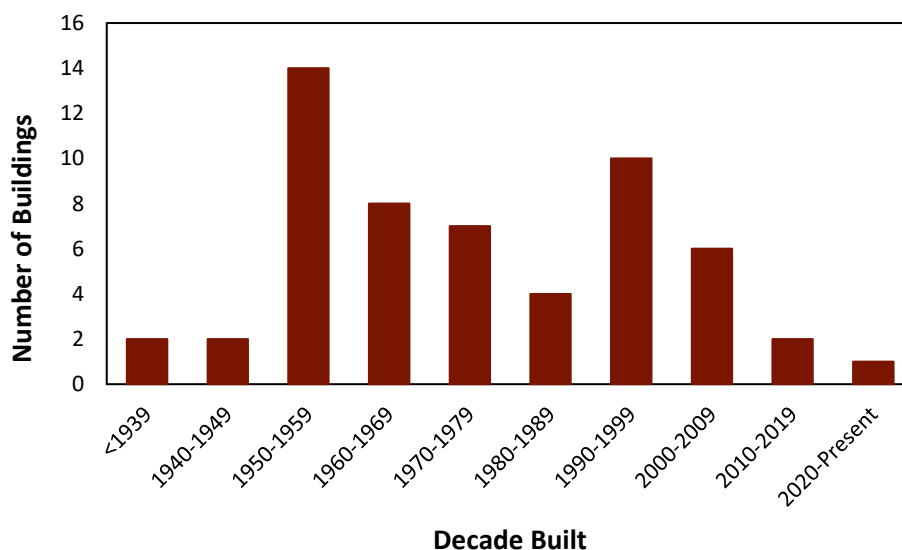


Figure 1a: WCDSB Building Stock

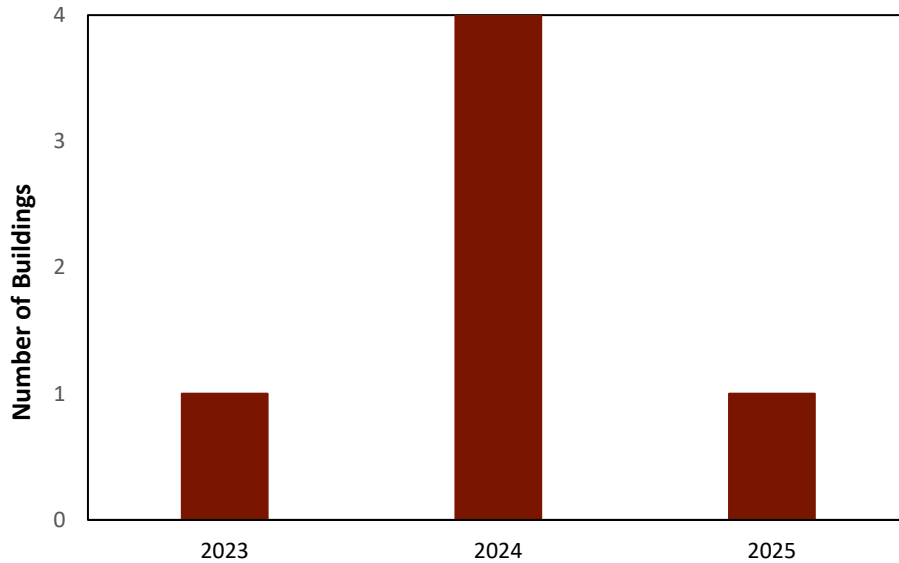


Figure 1b: Future Building Stock

Energy Management Variables

Energy consumption at a site can be impacted by several variables. Table 1 summarizes the key metrics and variables that influence energy consumption in the Board’s asset portfolio that changed from the baseline year 2017-2018 to 2020-21. Note that any increase in floor area, enrolment, and air-conditioned space will increase energy consumption.

Table 1: Change in Asset Portfolio Metrics that Impact Energy Consumption

Variables	FY 2017-18 (Baseline)	FY 2021-22	Variance From Baseline
Total Number of Buildings	60	56*	-4
Total Number of Portables/Portapacks	127	189	62
Total Floor Area (m2)	273,507	269,410	-4097
Average Operating Hours	78	98**	20
Average Daily Enrollment	22,094	24,478	2384
Total Floor Area Occupied by Child Care (m ²)	5,586	6258	672
Air-Conditioned Classroom Percentage	83%	98%	15%

* Refer to the detailed asset list in “APPENDIX A: PROFILE OF WCDSB BUILDINGS.

** We have increased the daily operating hours of the mechanical equipment as one of our COVID-19 prevention measures.

ENERGY MANAGEMENT AT WCDSB

WCDSB Energy Management Framework

The Waterloo Catholic District School Board Energy Management Framework is based on the relationship of four pillars (see Figure 2):

- Design
- Operation and Maintenance
- Construction and Retrofitting Strategies
- Occupant Behaviour

Developing a proper building design in the preliminary stages and carefully constructing the components (e.g., lighting and building envelope) and systems (e.g., HVAC and controls) is especially important.

However, even more crucial is how existing buildings are being maintained and operated to achieve optimal performance. Monitoring and tracking building performance is an ongoing process for Facility Services staff. Using Building Automation Systems (BAS), the maintenance department and custodians have been able to identify mechanical problems and inefficiencies in building systems.

Over their lifespan, WCDSB buildings have been renovated and retrofitted to be more comfortable and energy efficient. Understanding the end users' needs and providing a welcoming and vibrant atmosphere for WCDSB students and staff has been the Board's priority.

The last pillar is occupant behavior. WCDSB has diverse user groups (e.g., students, staff, and community groups) and each of them use buildings differently. Through education as well as sustainable programs and practices, the occupants of WCDSB buildings are developing more mindful behaviours and practices to reduce the use of natural resources. For the Board's historical, current, and future energy related projects using these four pillars please refer to Appendix D.

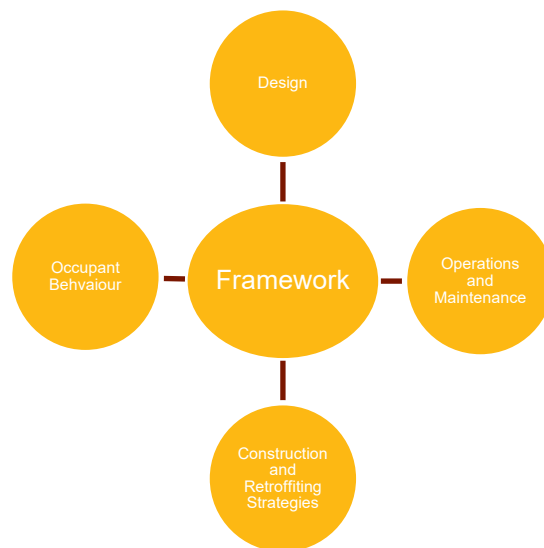


Figure 2: Four Pillars of Energy Management

Energy Consumption Data

To understand the performance of buildings, WCDSB has been collecting, monitoring, and analyzing its utility consumption. Electricity and natural gas data are gathered from utility bills, the local utilities, and Utilismart. To satisfy legislated annual energy reporting requirements, the Ministry of Education and a third-party consultant have developed the Utility Consumption Database (UCD) which pulls usage data directly from utility providers. An additional benefit of the UCD is that it serves as a tool to analyze the energy profile of the Board and individual sites in relation to each other and to other similar facilities across the province.

The following Table (2) lists the metered consumption values in the common unit of kilowatt hours (kWh) and equivalent kilowatt hours (ekWh).

Table 2: Energy Profile (Raw Data)

	2017-18	2018-19	2019-20	2020-21	2021-22
Total Electricity (kWh)	26,472,808	25,585,560	21,914,686	22,241,892	23,539,692
Total Natural Gas (ekWh)	38,419,280	39,264,828	34,180,820	33,162,986	31,811,856
Total Energy Consumed (ekWh)	64,892,088	64,850,388	56,095,506	55,404,878	55,351,548
Energy Intensity (ekWh/m ²)	236	232	200	199	195

Weather Normalized Energy Consumption Data

In Ontario, 25% to 35% of energy consumption for a facility is impacted by weather. To quantify the year-to-year weather variability, the following chart shows the Weighted Average Heating Degree Days (HDD) and Cooling Degree Days (CDD) in Ontario (Table 3). HDD is a measure of how cold the year was: the higher the number, the more heating was required. CDD is the equivalent metric, but for the cooling demand. The data in table 3 was obtained through the UCD.

Table 3: Heating Degree Days and Cooling Degree Days in Waterloo for FY2018 to FY2022

	2017-18	2018-19	2019-20	2020-21	2021-22
Heating Degree Days	4,126	4,337	4,033	3,912	4,021
Cooling Degree Days	293	218	290	254	211

The best way to compare energy consumption values from one year to another is to use weather normalized values as they take into consideration the impact of weather on energy performance and allows an “apple-to-apple” comparison of consumption across multiple years. To also account for variations in the Board’s asset portfolio, it is best to compare weather normalized Energy Intensity by floor area between years. However, a straight comparison of Total Energy Consumed between one or more years (Figure 3) does not take into consideration changes in a Board’s asset portfolio, such as changes in buildings’ features and newly implemented programs which will greatly impact energy consumption. As a

result, weather normalized energy intensity 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.

Table 4: Energy Profile (Weather Normalized)

	2017-18	2018-19	2019-20	2020-21	2021-22
Total Electricity (kWh)	26,158,712	25,370,604	22,027,796	22,588,010	23,649,146
Total Natural Gas (ekWh)	38,031,884	36,637,432	34,305,352	33,752,732	30,974,516
Total Energy Consumed (ekWh)	64,190,596	62,008,036	56,333,148	56,340,742	54,623,662
Energy Intensity (ekWh/m ²)	233	222	201	202	192

WCDSB over the past 8 years (from FY2014 to FY2022) has been decreasing its energy consumption. Refer to Table 5 and Figure 3 below.

Table 5: Decreased Energy Consumption – Raw Data and Weather Normalized Data FY2014 vs FY 2022

	2014	2022	Variance
Actual (ekWh)	64,711,636	55,351,548	(-14.5%)
Adjusted (ekWh)	58,831,068	54,623,662	(-7.2%)

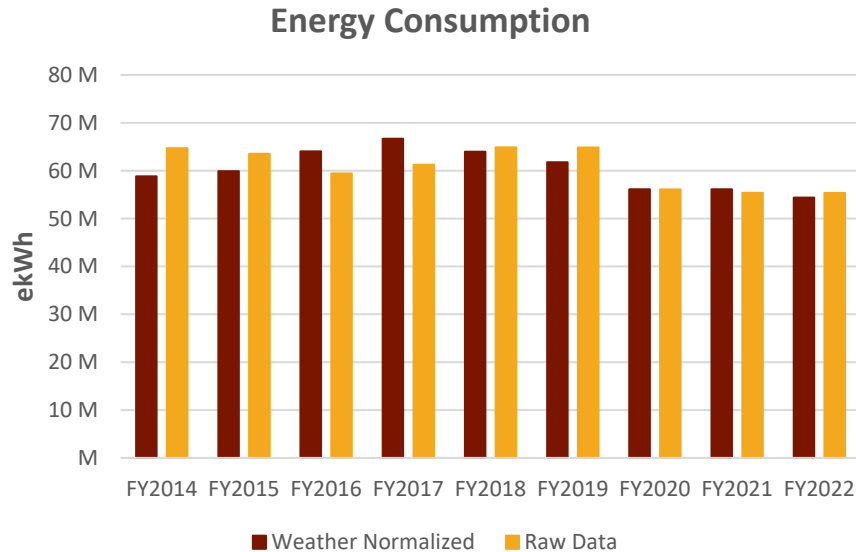


Figure 3: Energy Consumption – Raw Data and Weather Normalized Data FY2014 vs FY 2022

Review of Current and Future Energy Conservation Targets and Achievements

To address climate change and associated negative impacts, in 2019, the Waterloo Catholic District School Board established a new target to reduce its annual energy use by 5% from 2017-18 levels by 2022-23. To meet this target, WCDSB implemented conservation measures through design, construction, as well as operation and maintenance of facilities. Since the 2013-2014 fiscal year, WCDSB has invested over \$22,000,000 and is planning to continue this trend (subject to funding availability, local priorities, and Board approval) in diverse energy reduction strategies such as the upgrade of mechanical and HVAC equipment, new rooftop units, new roofs, new windows and doors, environmental programs, workshops, and staff training.

In Figure 4 and Table 6 below you can observe that there was a 15% reduction in energy consumption and an 18% reduction in energy intensity from 2017-18, mostly due to school closures during the COVID-19 pandemic. Specifically, there has been a 10% reduction in electricity consumption and a 19% reduction in natural gas consumption from the 2017-18 school year. From March to September of 2020, all schools had their heating temperature set points changed from 21°C to 18°C. To increase safety for building occupants, ventilation systems were set to run from 1 to 3 hours before and after bell times.

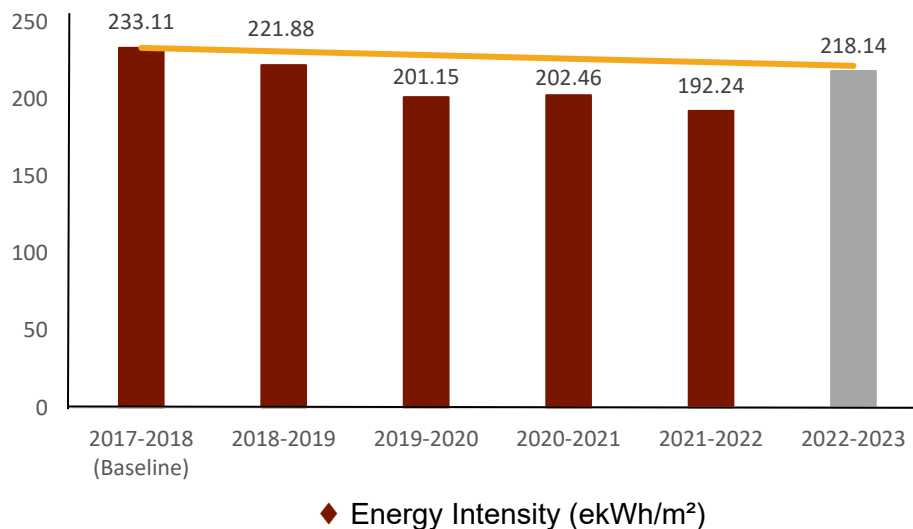


Figure 4: Energy Intensity and Reduction Progress (Weather Normalized to FY2018)

The Energy Intensity Reduction Forecasts for the 5-year period have been calculated based on the Board's plans for its Renewal and SCI funding (Table 6). The breakdown into each category is provided in Appendix C1-C4.

Table 6: Energy Intensity Reduction Forecasts

Fiscal Year	EI Reduction Based on Projects (ekWh/m ²)	Weather Normalized EI (ekWh/m ²)	1% Reduction Goal (ekWh)	Weather Normalized Energy Consumption (ekWh)
2017-18	BASE	233.11	64,190,596	64,190,596
2018-19	7.83 (-3.36%)	221.88 (-5%)	63,548,690	62,008,036 (-3%)
2019-20	9.07 (-3.90%)	201.15 (-14%)	62,906,784	56,333,148 (-12%)
2020-21	5.64 (-2.42%)	202.46 (-13%)	62,264,878	56,340,744 (-12%)
2021-22	8.31 (-3.57%)	192.24 (-18%)	61,622,972	54,623,664 (-15%)
2022-23	7.07 (-3.04%)	TBD	60,981,066	TBD

In addition, the Board met its GHG reduction target that was set in 2016 with Sustainable Waterloo Region. The goal was to reduce 20% of Board's GHG emission from 2014 levels by 2024. This target was achieved in only 5 years (Figure 5).

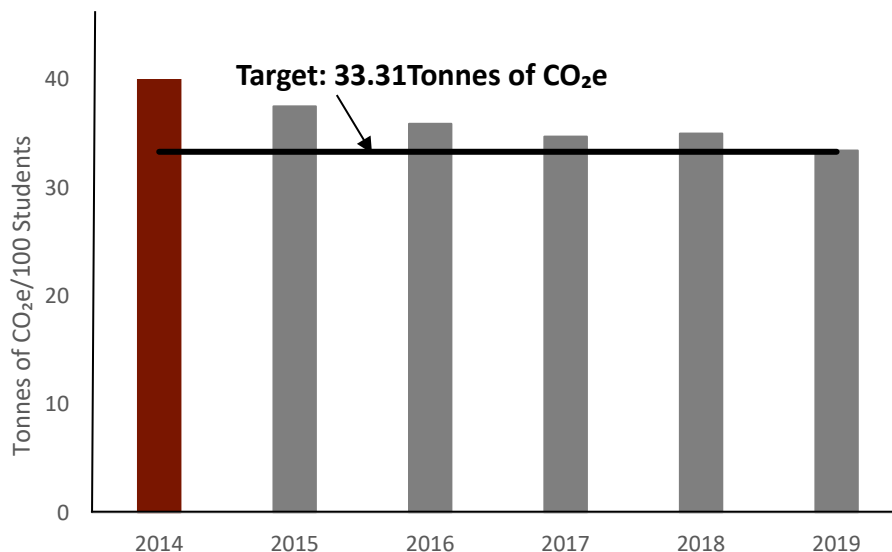


Figure 5: Total Tonnes of CO₂e/100 Students

Achieving the forecasts in this plan depends on a variety of factors. In the coming fiscal years, the Board will continue to install air-conditioning. Before and After School programming is also expected to expand. Enrollment is expected to continue to increase, expanding the number of portables that are required. Portables have a higher energy intensity than permanent buildings. These changes will increase energy intensity and are not factored into the forecasts. The forecasts are also based on the current funding model for Renewal and SCI. Any changes to these funding models will change the ability of the Board to achieve the forecasted reductions.

Most of the above forecasts come from retrofit projects, equipment replacement and building repairs that are otherwise required. The following actions will also be taken to maximize the likelihood of achieving these forecasts:

Design, Construction and Retrofit Strategies

» When retrofitting buildings, existing equipment will be replaced with energy efficient models.

Operations and Maintenance Strategies

» As part of the ECDM Plan, WCDSB staff will be monitoring electrical demand to reduce its peak consumption.

» Preventative maintenance activity for HVAC equipment will be conducted regularly including filter changes.

» Preventative maintenance procedures for seasonal start up for cooling and heating systems were also developed and will be followed.

» The HVAC systems will be adequately maintained and operated in the most efficient and economical way. To reduce our energy consumption, the HVAC systems will be programmed to operate only when buildings are occupied. Building control systems can be tailored to accommodate schedules for the regular school day, extended day programs, community use, and for school events.

» Development of a set of standards for existing building stock and new builds. Retrofitting standards for existing buildings are to include requirements for procurement, as well as operation and maintenance of energy efficient equipment and procedures. The Board strives to achieve total energy consumption of 12 ekWh/ft², 15 ekWh/ft² and 20 ekWh/ft² for new elementary, secondary, and administrative buildings respectively.

Occupant Behaviour Strategies

» Continuing to provide in-house training for custodians to operate equipment as technology advances.

» Creating a culture of energy consumption consciousness.

» Electronic equipment will be turned off and unplugged when not in use, particularly during longer periods such as summer months. This includes computers, monitors, printers, photocopiers, bright link devices, and kitchen appliances.

Trend over the past 8 years

Over the past 8 years the overall trend for greenhouse gas (GHG) emissions has been decreasing. In 2014, actual GHG emissions were 9,911,189 kg CO₂ while in 2022, actual GHG emissions were 6,328,100 kg CO₂. This reduction occurred even with the addition of new schools, portables, and an increase in enrollment. See Table 7 and Figure 6 below for a comparison which includes the actual and adjusted data.

Table 7: GHG Emissions Reduction Over Past 8 Years

2014	2022	2014	2022
Adjusted	Adjusted	Actual	Actual
8,693,246 kg CO ₂	7,249,477 kg CO ₂	9,911,189 kg CO ₂	6,328,100 kg CO ₂

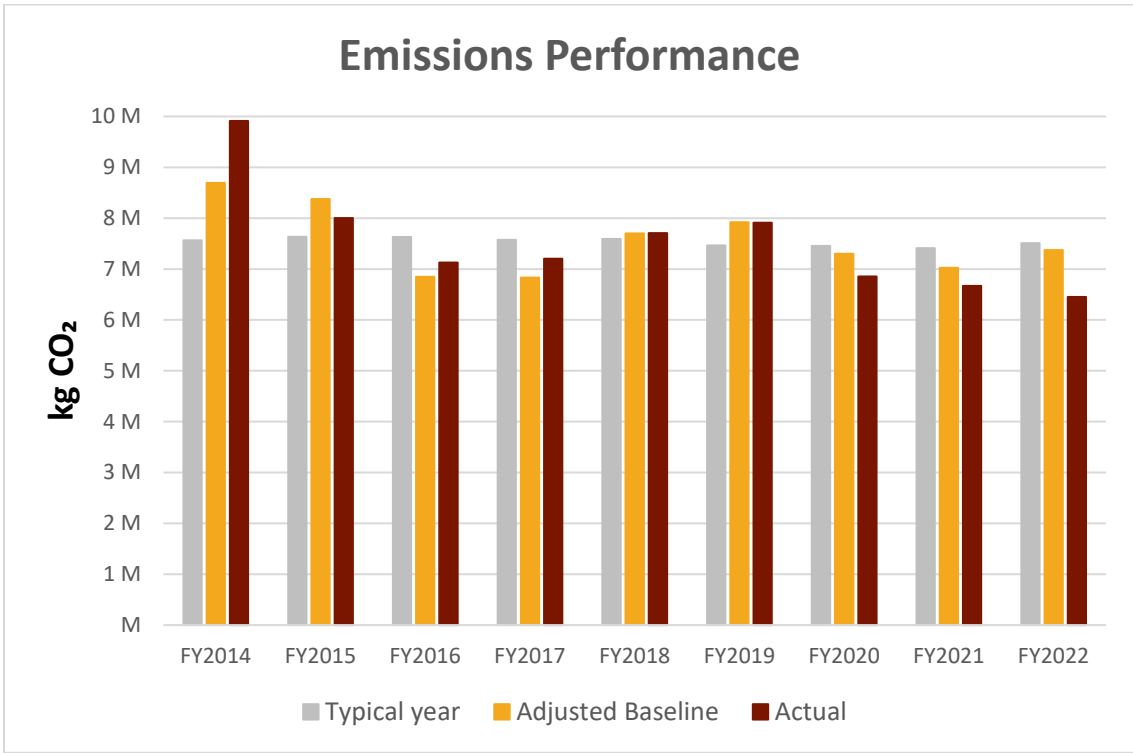


Figure 6: Emissions Performance from FY2014 - FY2022

Energy Management Strategies

A description of WCDSB historic, current, and proposed measures to reduce energy consumption including a forecast of expected results of current and proposed measures is described in sections below, under Figure 7. A detailed list of the measures implemented, the associated school, and the fiscal year that the measure was implemented within the board are outlined in Appendix D.

- » In 2008, WCDSB established the Environmental Committee Group (now called Sustainable Development Committee). The role of the committee is to make recommendations to WCDSB Executive Council to ensure broad-based, long term sustainability. The committee consists of members from various areas of the WCDSB. The Sustainable Development Committee meets quarterly and uses communication technology frequently to reduce the need for in-person meetings.
- » In 2009, the [Sustainable Development Policy](#) was created to establish sustainable practices and initiatives across the school system.
- » In 2011, WCDSB developed its first Energy Conservation Plan that contained energy conservation measures and best practices. The plan proposed indoor and outdoor lighting to be upgraded to more efficient lamps. The plan also included a temperature standard for heating and cooling. During winter months, heating was set at 22°C for classrooms, offices, and meeting rooms. Secondary school shops, gymnasiums, change rooms, washrooms, and corridors were set at 20°C. All buildings had their night temperature set at 18°C. Cooling was set at 27°C after the first week in July until the last week of August, except where summer school was in session. In response to the COVID-19 pandemic, the heating set points were changed from 21°C to 18°C from March until September.
- » The Board has been applying for incentive programs to support the implementation of energy efficient projects on a regular basis. Since fiscal year 2010-11, the Board received over \$200,000 in incentive funding from various agencies to support the implementation of energy efficient projects. The Board also uses the services of the sector's Incentive Program Advisor.
- » In 2013, through a partnership with a solar developer, WCDSB received an approval from the Ontario Power Authority to install 17 solar photovoltaic (PV) systems through the FIT2 program. The 17 sites include: St. Agnes (100 kW), St. Benedict (325 kW), Canadian Martyrs (120 kW), St. Clement (60 kW), St. David (375 kW), St. Dominic (115 kW), St. Elizabeth (100 kW), Holy Spirit (175 kW), Saint John Paul II (145 kW), St. Kateri Tekakwitha (160 kW), St. Luke (200 kW), St. Mary (400 kW), St. Margaret (150 kW), St. Matthew (175 kW), St. Nicholas (180 kW), Resurrection (425 kW), St. Teresa of Calcutta (175 kW). These sites generate a total of 3380 kW of electricity that is being fed to the Ontario electricity grid.
- » As part of the Green Schools Pilot Initiative, WCDSB installed hot water solar panels at St. Mary's Secondary School. In addition, a 10kW solar PV system was installed at Monsignor Doyle Secondary School.
- » Social media presence was established in 2016 through the development of the www.ecozone.wcdsb.ca website and an associated twitter handle. The EcoZone website provides information on the Board's annual energy consumption, energy conservation projects, and sustainable initiatives and practices.
- » In 2016, an energy reduction target of 1% a year from 2013-14 levels was set to be achieved by 2023. In addition, a 20% GHG emissions target was set to be achieved by 2024 from 2014 levels.
- » In 2018, the Sustainable Development AP was updated and renamed [Environmental Education, Stewardship and Sustainability](#). The goal of this AP is to enable and coordinate sustainable practices throughout the organization. The WCDSB is committed to achieving continual, measurable improvements in the environmental education, stewardship, and sustainability practices within its control.

- » The Sustainable Development Committee normally meets every two months to discuss sustainable initiatives at the school and board office level.
- » In 2019, the Pope Francis Award for Ecological Leadership was created to recognize school staff members who actively demonstrate a love for creation and care for the planet in all their interactions.
- » In 2019, four ASHRAE II energy audits were completed at low performing schools to determine energy saving measures.
- » Facility Services meets regularly to discuss energy-related projects to ensure proposed targets are being met.
- » An internal process has been put in place to help address and track progress of energy goals. This allows for continuous measuring and monitoring of energy use and GHG emissions.
- » WCDSB participates in the CSBSA Natural Gas Management and Advisory Service natural gas purchasing consortium to cut down on procurement costs.
- » Current construction and energy projects include indoor and outdoor lighting upgrades, energy efficient boilers, rooftop units, heat pump replacements, new energy efficient windows and doors. Several schools are also getting upgraded building automation systems (BAS).
- » Due to the COVID-19 pandemic, ventilation was turned on for up to 3 hours before and after occupancy times. Higher-rated MERV air filters were added to the equipment starting December 2020 to ensure safety for students and staff.
- » 2021 and 2022 planned and completed energy projects are contained in Appendix C.

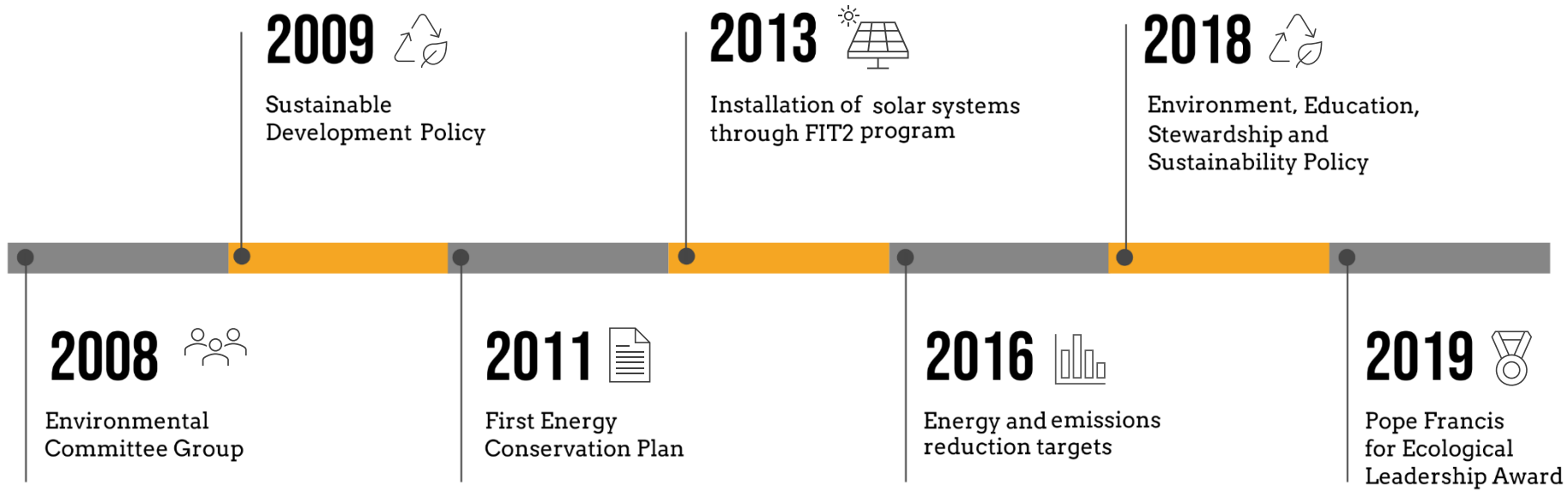
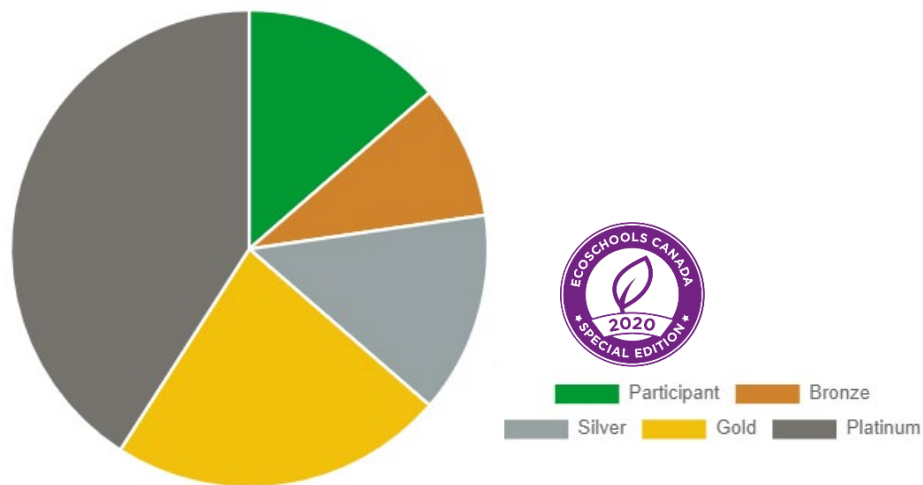


Figure 7: WCDSB Achievements

Environmental Programs and Community Engagement

Canada EcoSchools

Canada EcoSchools program has been instrumental in the development of sustainability education at the WCDSB. With the help of teachers and support staff at the Board's schools (particularly custodians), students are far more aware of the state of our natural environment and are tremendously engaged in environmental initiatives. WCDSB has put a lot of focus on student engagement and environmental programming. The Board continuously collaborates with local stakeholders such as local municipalities, not-for-profit organizations, charities, local colleges and universities, and businesses, to bring meaningful and direct sustainability experience. To support our student's experiential learning, we deliver customized workshops on topics including but not limited to waste diversion strategies, energy conservation practices, greening grounds, and food systems. In 2019-2020, 47 of WCDSB schools received the 2020 Special Edition Seal for their participation in EcoSchools Program. Under the leadership of the Sustainability Committee, a goal will be set to have all WCDSB schools (re)certified. Reporting on this goal will be part of the 2023 report.



Source: EcoSchools Canada

Food and Pollinator Gardens

Our students have enormous interest in pollinators and food gardens. Many of our schools grow pollinator flowers, veggies, herbs, and fruit in their gardens that they get to enjoy. Food gardens are an excellent way for community building and discovery-based learning. By growing their own food students learn the importance of eating healthily. As a result of the high demand for food gardens, in 2019, 15 garden beds were distributed to elementary schools. These garden beds were made by students from our five secondary schools.

REFERENCES AND SUPPORTING DOCUMENTS

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APPENDICES

APPENDIX A: PROFILE OF WCDSB BUILDINGS

Building Name	Building ft ²	Year Built
Elementary Schools		
Blessed Sacrament	39,522	1988
Canadian Martyrs	30,733	1967
Christ The King	26,237	1978
Holy Family	25,381	1959
Holy Rosary	50,916	1989
Holy Spirit	49,390	2002
John Sweeney	59,948	2003
Monsignor Haller	23,296	1971
Our Lady of Fatima	49,949	1959
Our Lady of Grace	22,131	1976
Our Lady of Lourdes	32,930	1948
Saint John Paul II	60,476	2010
Sir Edgar Bauer	47,165	1970
St. Agnes	25,909	1956
St. Aloysius	28,064	1954
St. Anne (Cambridge)	27,966	1965
St. Anne (Kitchener)	49,712	1947
St. Augustine	39,407	1991
St. Bernadette	27,454	1952
St. Boniface (Breslau, New School)	43,500	2021
St. Brigid	54,517	2017
St. Clement	27,119	1969
St. Daniel	28,709	1958
St. Dominic Savio	44,303	1999
St. Elizabeth	39,590	1992
St. Gabriel	45,897	2014
St. Gregory	25,517	1958
St. John	48,402	1929
St. Joseph	22,176	1959
St. Kateri Tekakwitha	40,205	1992
St. Luke	60,088	2002
St. Margaret of Scotland	38,115	1990
St. Mark	23,011	1978

St. Matthew	44,329	1995
St. Michael	30,390	1952
St. Nicholas	45,370	2002
St. Paul	35,032	1964
St. Peter	34,656	1963
St. Teresa (Kitchener)	30,545	1953
St. Teresa of Avila (Elmira)	26,763	1964
St. Teresa of Calcutta (Cambridge)	46,033	1998
St. Timothy	25,092	1981
St. Vincent de Paul	62,678	2018
Secondary Schools		
St. Benedict	200,985	1997
St. David	161,012	1965
Resurrection	201,850	1990
St. Mary	215,878	2002
Monsignor Doyle	150,720	1976
St. Francis Cambridge (Leased)	27,882	1968
St. Louis Adult Learning & Continuing Education Centre - (St. Francis campus – Kitchener)	14,651	1958
St. Louis Adult Learning & Continuing Education Centre – Main Campus	83,642	1957
St. Don Bosco Alternative Education (St. Mary's West Campus)	20,204	1966
St. Don Bosco (Leasing)	2,475	1974
Administrative Buildings		
WCDSB Catholic Education Centre	112,136	1955
Facility Services	34,179	1979
Administrative Storage (Maryhill)	22,162	1898

APPENDIX C1: Planned Investments in Energy Efficiency FY2019-23 – Design, Construction, and Retrofit

	FY2019	FY2020	FY2021	FY2022	FY2023
Lighting					
High-efficiency Lighting Systems including Occupancy and Daylighting Sensing	\$300,000	\$260,000	\$50,000	\$50,000	\$150,000
Exterior Lighting – LED retrofits	\$17,959	\$25,000	\$25,000	\$25,000	\$25,000
HVAC					
Efficient Boilers (high efficiency)	\$90,000	\$730,000	\$500,000	\$200,000	\$100,000
Energy Efficient HVAC Systems (Heat pump etc.)	\$1,990,000	\$939,000	\$1,190,000	\$1,800,000	\$750,000
Energy Efficient Rooftop Units	\$-	\$200,000	\$600,000	\$50,000	\$500,000
Energy Efficient Ventilation (ERV, New unit vent.)	\$1,605,000	\$975,000	\$1,000,000	\$150,000	\$150,000
Controls and Automation					
Building Automation Systems – New	\$80,000	\$-	\$ 50,000	\$-	\$500,000
Building Automation Systems – Upgrade	\$60,000	\$120,000	\$ 100,000	\$100,000	\$100,000
Building Envelope					
New Roofing	\$1,200,000	\$850,000	\$-	\$1,200,000	\$1,300,000
New Windows	\$275,000	\$-	\$ 900,000	\$600,000	\$-
Total Investments	\$5,617,959	\$4,099,000	\$4,415,000	\$4,175,000	\$3,575,000

APPENDIX C2: Planned Investments in Energy Efficiency FY2019-23 – Operations and Maintenance

	FY2019	FY2020	FY2021	FY2022	FY2023
Policy and Planning					
Procures Only Energy Start Certified Appliances	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000
Energy Audits					
Energy Audit	\$40,000				
Total Investments	\$43,000	\$3,000	\$3,000	\$3,000	\$3,000

APPENDIX C3: Planned Investments in Energy Efficiency FY2019-23 – Occupant Behaviour Strategies

	FY2019	FY2020	FY2021	FY2022	FY2023
Training and Education					
Participate in Environmental Programs, such as EcoSchools	\$10,000	\$2,000	\$10,000	\$10,000	\$10,000
Total Investments	\$10,000	\$2,000	\$10,000	\$10,000	\$10,000

APPENDIX C4: Planned Investments in Energy Efficiency FY2019-23 – Total Investments by Fiscal Year

	FY2019	FY2020	FY2021	FY2022	FY2023
Design, Construction, and Retrofit	\$5,617,959	\$4,099,000	\$4,415,000	\$4,175,000	\$3,575,000
Operations and Maintenance	\$43,000	\$3,000	\$3,000	\$3,000	\$3,000
Occupant Behaviour Strategies	\$10,000	\$2,000	\$10,000	\$10,000	\$10,000
Total Investments	\$5,670,959	\$4,104,000	\$4,428,000	\$4,188,000	\$3,588,000
Estimated Annual Energy Savings (ekWh)	2,141,201	2,470,069	1,541,645	2,274,190	1,932,787

APPENDIX D: Completed/Planned Energy Impacting Mechanical/Electrical Projects FY2022-FY2023

2021-2022 Projects	
St. Matthew – Heat Pump Replacement, Plumbing Fixtures, Domestic Water Distribution, Cooling Tower	Holy Spirit - RTU + Exhaust
St. David – Heat Pump Replacement (Underway)	Monsignor Doyle - Partial RTU Replacement
St. Margaret – Window Replacement	Our Lady of Lourdes - Partial Window Replacement + Unit Ventilators
Blessed Sacrament – Partial Roof Replacement	St. Anne (Cambridge) - Unit Ventilators
St. Elizabeth – Heat Pump Replacement, Fluid Cooler Replacement	St. Anne (Kitchener) - Unit Ventilators
St. Mary's – Partial Roof Replacement, Domestic Water Heater	St. Augustine - Window Replacement
Resurrection – Partial Heat Pump Replacement	St. Gregory - Boiler Replacement, Partial BAS Upgrade
St. Agnes – New Addition (Underway) + New Unit Ventilators, Boilers, Cabinet Unit Heaters	St. Joseph - Unit Ventilators, Partial Window Replacement + Building Envelope Upgrades

St. Aloysius – A/C for Kindergarten + Unit Ventilators	St. Nicolas - Rooftop Unit Replacement
John Sweeney - Rooftop Unit Replacement	St. Peter - Partial Window Replacement
St. Elizabeth – Heat Pump Replacement	St. Teresa (Kitchener) - Unit Ventilators
Facilities Building - Partial window replacement	

2022-2023 Projects	
St. Mary's – Chiller Upgrade, BAS Upgrades, Roof Replacement	St. Luke – Partial Rooftop Unit Replacement, BAS Upgrades, Boiler Replacement, LED Lighting Upgrade
St. John Paul II – BAS Upgrades, Exhaust Upgrade	Resurrection – Boiler Replacement, Lighting Controls
St. Teresa of Calcutta - Lighting Upgrade	Holy Family – Partial Rooftop Unit Replacement, Boiler Replacement
St. John – LED Controls	John Sweeney – Lighting Controls
Our Lady of Grace – BAS Upgrades	St. Francis (C) - Partial Roof Replacement
St. Benedict - A/C in building Annex	St. Paul – Roofing Replacement, DHW Heaters, Exhaust Fan Upgrade, BAS Upgrade
St. Clement - Boiler Plant Replacement/Controls	Dominic Savio – Boiler Replacement, BAS Upgrades, LED Lighting, Exhaust Fan Upgrade
St. Elizabeth - Window Replacement	

SENIOR MANAGEMENT APPROVAL OF THIS ENERGY CONSERVATION AND DEMAND MANAGEMENT PLAN

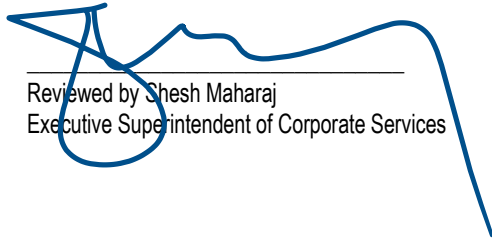
I confirm that Waterloo Catholic District School Board's senior management has reviewed and approved this Energy Conservation and Demand Management Plan.

Zeb Foss

Updated by Zeb Foss
Energy Conservation Supervisor

May 29, 2023

Date



Reviewed by Shesh Maharaj
Executive Superintendent of Corporate Services

May 29, 2023

Date

