ENERGY CONSERVATION AND DEMAND MANAGEMENT PLAN

Waterloo Catholic District School Board

Quality, Inclusive, Faith Based Education

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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.

WCDSB conservation measures to date are a broad sweep of inspirational ideas. The way in which these initiatives have been adopted and supported across the Board is a direct result of the Board's successful history and optimism for the future. While these strategies have provided excellent resources for staff, if we are to truly "live our mission" then green thinking must be woven throughout all future planning and day-to-day operations. An action-based, goal-oriented Energy and Environmental Plan is needed.

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 Multi-Year Strategic Plan.

WCDSB is actively addressing long-term sustainability in the following key areas: Energy & Water; Purchasing & Waste; Buildings & Grounds; Food & Drink; Inclusion & Participation; and Local Well-Being. 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.

VISION

- An innovative school board where students and staff work together to reduce energy usage in all Waterloo Catholic District School Board buildings.

ENERGY REDUCTION TARGET

- To reduce stationary energy consumption by 1% on annual basis from 2013/2014 school year and to improve comfort.

APPROACHES

- Using existing resources and infrastructure.
- Developing a professional network through OASBO: OMC Energy Sub-Committee, Ministry professionals, local utility companies, and local leaders.
- Measuring and monitoring progress on energy use and GHG emissions.
- Commiting to continuous energy reductions and best practices.
- Promoting ongoing training and awareness programs for energy conservation.
- Encouraging students and staff to participate in environmental initiatives and programs.

FOCUS AREAS

- To reduce stationary energy consumption such as electricity and natural gas from elementary and secondary schools, and administrative buildings.

GOALS & OBJECTIVES

- To reduce energy use per square foot in all WCDSB buildings.
- To develop best practices for the operations, maintenance, and retrofit of existing buildings.
- To strive to lead Ontario School Boards in the area of sustainable practices and programs.

LEGISLATIVE REQUIREMENTS

Ministry Reporting Requirements

The Provincial Government has committed to help public agencies better understand and manage their energy consumption. As part of this commitment, Regulation 397/11 under the Green Energy Act, 2009 requires certain public agencies — Municipalities, Municipal Service Boards, Schools Boards, Universities, Colleges and Hospitals — to report on their energy consumption and greenhouse gas (GHG) emissions annually beginning in 2013, and to develop and implement five-year energy conservation and demand management (ECDM) plans starting in 2014. In 2019, public institutions were required to provide an updated version of the ECDM that will also include a future energy plan for the 2019 – 2023 period. WCDSB has been updating its ECDM annually, so this legislated update is not an onerous task.

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; and
- Support the preparation of 5-year conservation and demand management plan as required under regulation.

In their long-term energy plan, the Ontario Ministry of Energy has set “a demand savings target of 7,100 MW and an energy savings target of 28TWh by 2030” (Ontario Ministry of Energy, 2013, p. 4). 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). 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 Canadian Net-Zero Emissions Accountability Act (Government of Canada, 2021).

The institutional and commercial sectors play an important role at reducing energy consumption and related GHG emissions.

Energy Conservation and Demand Management Requirements

To meet provincial energy reduction targets, the Ministry of Energy has developed the following requirements:

(1) A public agency shall prepare, publish, make available to the public and implement energy conservation and demand management plans or joint plans in accordance with sections 6 and 7 of the Act and with this Regulation 507/18, s. (1).

(2) An energy conservation and demand management plan is composed of two parts as follows:

a) A summary of the public agency's annual energy consumption and greenhouse gas emissions for its operations.

b) 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. O. Reg. 507/18, s. 4 (2).

EDUCATION SECTOR BACKGROUND

Funding and Energy Management Planning

The WCDSB receives 75% of its funding from the Province of Ontario (Province), 21% from Municipalities, and 4% from other sources. The Province announces each board's funding allocation 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. The two main funding sources for energy conservation projects include the School Renewal Allocation (SRA) and School Condition Improvement (SCI) grants. In 2020, because of the COVID-19 pandemic school boards received funds to support the high demand for ventilation and air quality as well as energy related projects. WCDSB received in total $8.6M from the COVID-19 Resilience Infrastructure Stream (CVRIS), the Climate Action Incentive Fund (CAIF), and the Air Quality Funding.

Building Profile of the Board

The Waterloo Catholic District School Board serves approximately 23,650 students 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, 4 continuing education sites, and 2 administration facilities (Appendix A). The current building stock was built between 1898 and 2018. Buildings built between 1950 and 1970 represent the largest building stock (Figure 2). WCDSB has been expanding into existing building stock to meet its needs (Appendix B).

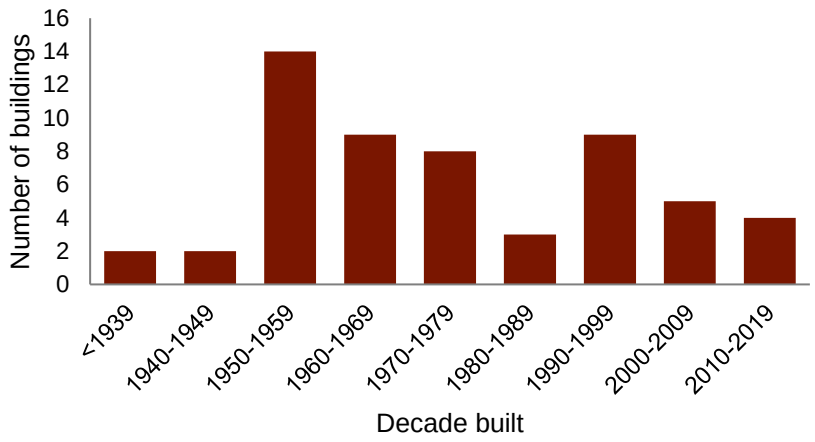


Figure 1: WCDSB Building Stock

Asset Portfolios and Energy Management Planning

Energy consumption at a site can be affected by several variables that could impact changes in consumption at a site from one year to the next. 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 2019-2020. Note that the 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 2018-19	FY 2019-20	Variance from baseline
Total Number of Buildings	60	59	56	4
Total Number of Portables/Portapaks	127	138	170	43
Total Floor Area (m^2)	273,507	277,746	280,444	6,937
Average Operating Hours	78	78	78	-
Average Daily Enrolment	22,094	22,813	23,646	1,552
Total Floor Area Occupied by Child Care (m^2)	5,586	5,586	5,586	-
Floor Area Air-conditioned (m^2)	227,165 (83%)	233,283 (84%)	241,182 (86%)	14,017 (3%)

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: Design; Operation and Maintenance; Construction and Retrofitting Strategies; and Occupant Behaviour (Figure 1).

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

However, even more crucial is how the 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 the custodians have been able to identify mechanical problems and inefficiencies in the 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 of great importance 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.

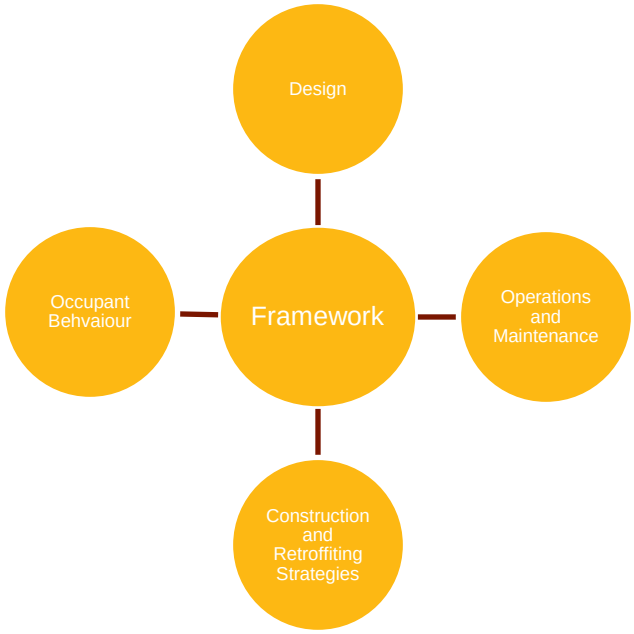


Figure 2: Four Pillars of Energy Management

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 electrical demand is also monitored on monthly basis and when required.

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

Table 2: Energy Profile (raw data)

Fiscal Year	2017-2018	2018-2019	2019-2020
Total Electricity (kWh)	26,060,111	25,728,640	22,136,648
Total Natural Gas (ekWh)	37,591,089	39,137,157	32,741,222
Total Energy Consumed (eKWh)	63,651,199	64,865,797	54,877,872
Energy Intensity (ekWh/m^2)	233	224	196

Weather Normalised 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.

Table 3: Heating Degree Days and Cooling Degree Days in Ontario 2018 to 2020

Fiscal Year	2017-2018	2018-2019	2019-2020
Heating Degree Days	3989	4196	3837
Cooling Degree Days	432	334	415

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.

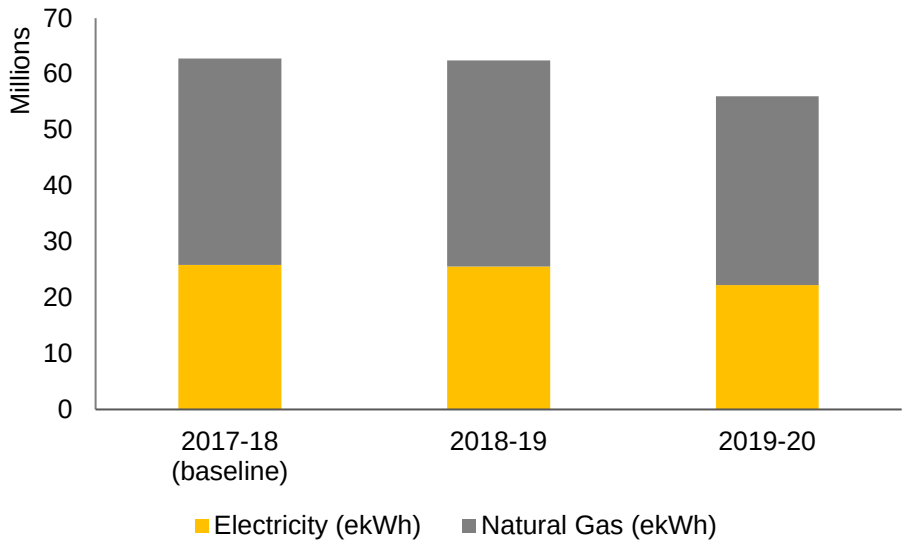


Figure 3: Energy Profile (weather normalized data to FY2018)

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 has implemented conservation measures through design, construction, as well as operation and maintenance of facilities. Since the 2013-2014 fiscal year, WCDSB has invested $22,300,000 and is planning to invest another $24,076,960 (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 4 below you can observe that there was an 11% reduction in the energy consumption and 13% reduction in energy intensity from 2017-18 (Figure 4), particularly due to school closures during the COVID-19 pandemic. Specifically, there has been a 14% reduction in electricity consumption and 9% reduction in natural gas consumption from 2017-2018 school year. From March to September of 2020, all schools had their heating temperature set points changed from 21°C to 18°C. To get greater air exchange into the buildings, the air flow was increased in the morning and evening from 1 to 3 hours before and after unoccupied time.

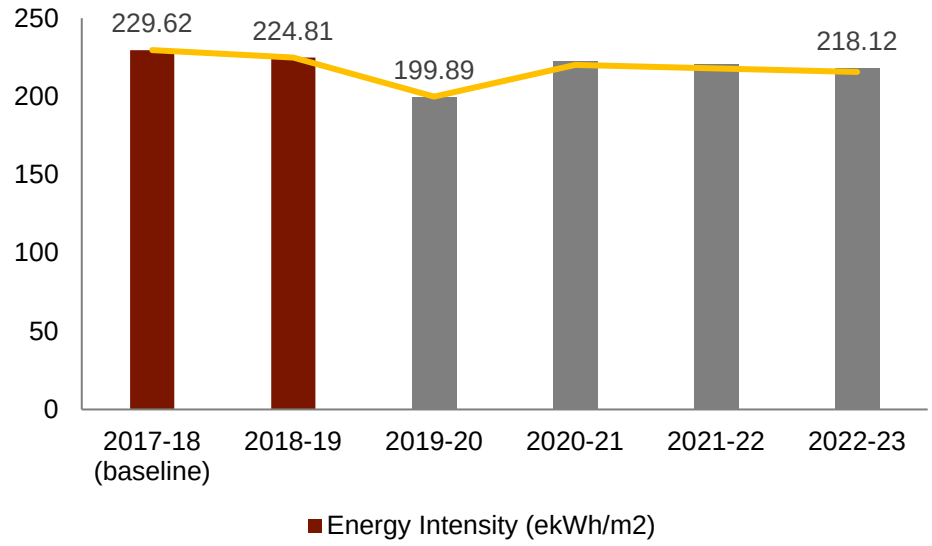


Figure 4: Energy Intensity and Reduction Progress (weather normalized to FY2018)

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 4). The breakdown into each category is provided in Appendix C1-C4.

Table 4: Energy Intensity Reduction Forecasts

Fiscal Year	EI Reduction Based on Projects (ekWh/m²)	Actual EI (ekWh/m²)	1% Reduction Goal (ekWh)	Actual Energy Consumption (ekWh)
2017-2018	**BASE**	**229.62**	**62,802,625**	**62,802,625**
2018-2019	7.83 (-3.36%)	224.81	62,174,599	62,440,844
2019-2020	9.07 (-3.90%)	199.89 (-13%)	61,546,572	56,057,000 (-11%)
2020-2021	5.64 (-2.42%)		60,918,546	
2021-2022	8.31 (-3.57%)		60,290,520	
2022-2023	7.07 (-3.04%)		59,662,494	

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).

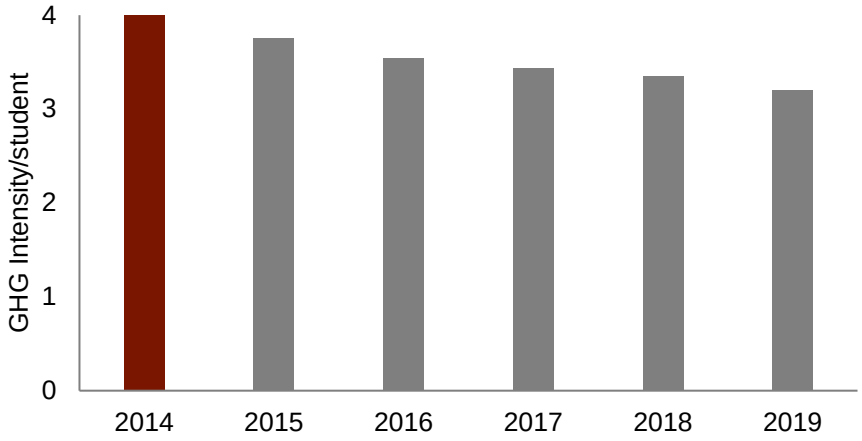


Figure 5: Total CO2e (tonnes) / students

Achieving these Forecasts depends on a variety of factors. In the coming 5 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. In total, they are estimated to save the Board $850,000 per year in avoided utility costs once they are all complete. In addition to these projects, the following actions will be taken to maximize the likelihood of achieving these forecasts:

Design, Construction and Retrofit Strategies

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

Operations and Maintenance Strategies

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

» Preventative maintenance procedures for inspection, frequency, and filter changes for all equipment will be followed.

» 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 only operate during times it is required to provide optimal comfort. For instance, the ventilation systems should be turned off and the temperature should be maintained until the end of the custodians' shift, where possible. When necessary, this setting can be overridden.

» 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/ft^2, 15 ekWh/ft^2 and 20 ekWh/ft^2 for new elementary, secondary and administrative buildings respectively.

» After school programs and community use of schools will be taken into consideration when programing lighting or mechanical equipment.

Occupant Behaviour Strategies

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

» Creating a culture where lights will be turned off when classrooms and common spaces are not in use.

» 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. Decreasing unnecessary use of energy, the same equipment will be reduced through consolidation (e.g., personal printers).

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 6. A detailed list of the measures implemented, the related costs, and the fiscal year that the measure was implanted within the board are outlined in Appendix D.

» In 2008, WCDSB established the Environmental Committee Group. The role of the committee is to make recommendations to WCDSB Executive Council to ensure broad-based, long term sustainability. The committee consists of 10 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. This goal was achieved in 2020.

» In 2018, the Sustainable Development Policy was updated and renamed to Environment, Education, Stewardship and Sustainability Policy. The goal of this policy 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 Environmental Committee meets every two months to discuss sustainable initiatives at the school and board office level. This year the Committee developed a short-term plan of action including a Board-wide Earth Hour and Earth Week Challenge.

» 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 a 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.

» Continuous promotion of energy conservation measures and sustainable practices.

» 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, the scheduled running time was changed in the morning and evening from 1 hour to 3 hours before and after unoccupied time to allow for greater air exchanges in the building. Higher rated MERV air filters were added to the equipment, where possible, starting December 2020 to ensure safety for students and staff.

» In 2020, preventative maintenance was done on all HVAC, air exchangers, unit ventilators and boiler systems.

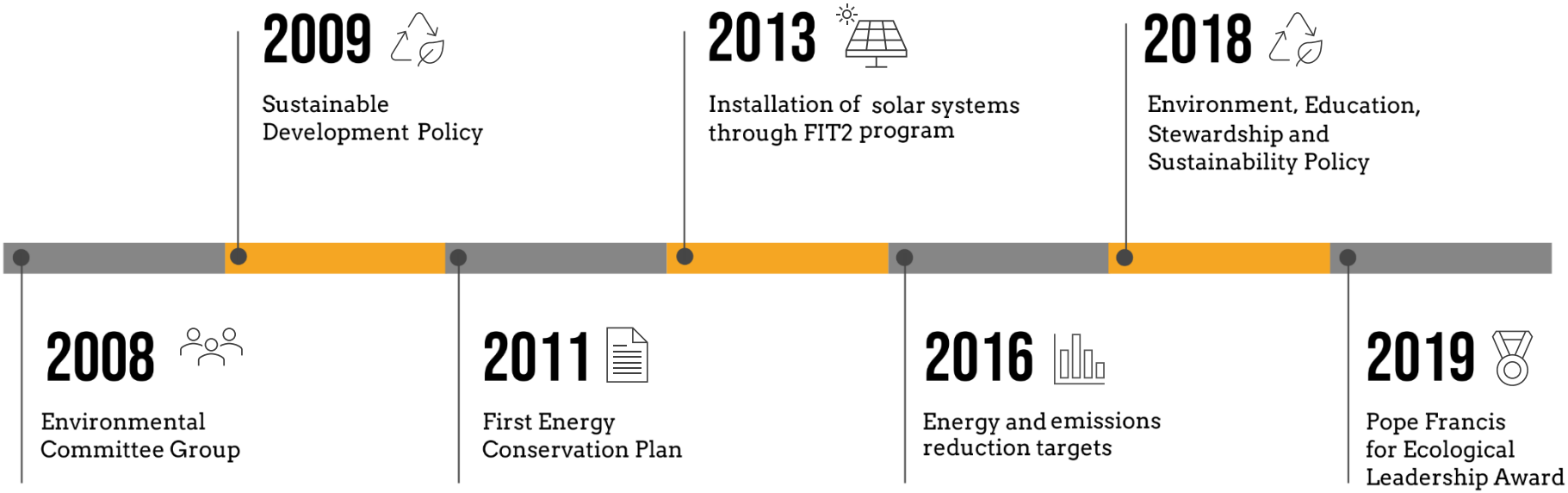
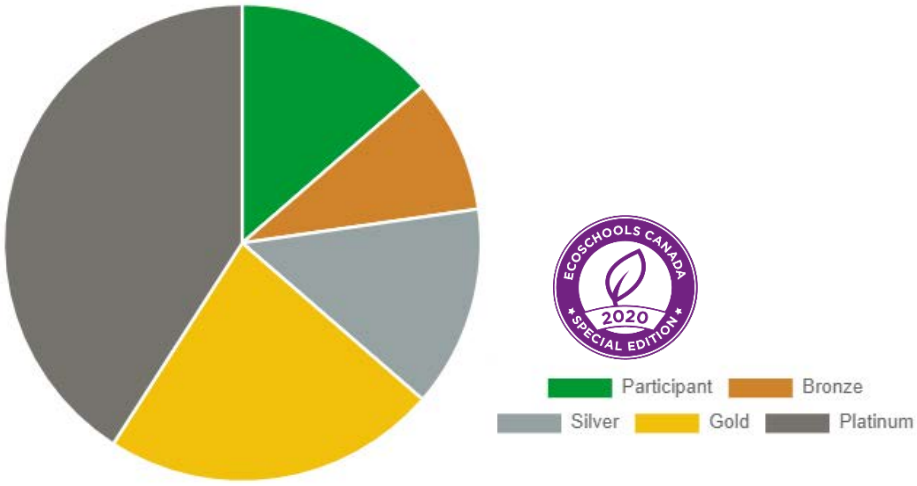


Figure 6: WCDSB Achievements

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 about 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 organisations, charities, local colleges and universities, and businesses, to bring meaningful and hands-on sustainability experience. To support our student's experiential learning, we deliver customized workshops on topics included but not limited to waste diversion strategies, energy conservation practices, greening grounds, and food systems. In 2020, 47 of WCDSB schools received the 2020 Special Edition Seal for their participation in EcoSchools Program.



Source: EcoSchools Canada, 2021

Food and Pollinator Gardens

Our students have enormous interest for pollinator 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 healthy. 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. During 2019-2020 school year, several schools continued to grow food and offer their yields to the students and the community.

Waste Reduction

Waste reduction and diversion strategies have been top priority for WCDSB. During the pandemic participation of these strategies and programs has been challenging; however, we hope that our schools will be able to continue their waste reduction practices soon.

Pope Francis Award for Ecological Leadership

WCDSB is blessed with many leaders who heed the call of Pope Francis to implement both little everyday gestures and larger cultural movements towards a culture of care that halts environmental degradation (Laudato Si', #231). In 2019-2020, in recognition of their fantastic leadership, three Board members received the award: Marlene DeGroot-Maggetti, St. Mary CSS, Dorothea Kruger, St Michael CES, and Heidi Rudy St. Nicholas CES. These awards were made by a local artist Jennifer Van-Overbeeke.

Community Research Projects

Clean Air Quality Project

WCDSB along with Waterloo Region District School Board were selected to participate in a research project led by Dr. Hind A. Al-Abadleh at Wilfrid Laurier University and the City of Kitchener to study "The Effect of Declaring State of Emergency in Response to COVID-19 on Air Quality in the City of Kitchener". As part of this study, air quality at four different school sites (St. Bernadette CES, J.F. Carmichael PS, Suddaby PS, and Smithson PS) was monitored and compared to the air quality in the Victoria Park in Kitchener. The real time data can be accessed via the Air Quality Kitchener's website.

The outcomes of the 2020 Clean Air Research Project revealed that students' and teachers' engagement in the Region is fundamental for maintaining good air quality levels and reducing air pollutants. Therefore, the second phase of this research project will take place in 2021-2022 and will include outreach and student engagement.

Sustainable IT Procurement Policy

Between 2020 and 2021, WCDSB, along with several post-secondary education institutions and municipalities across the country participated in the Sustainable IT Procurement Policy project. This project was designed by Green Economy Canada in collaboration with HP Canada and the Regional Sustainability Initiative to support members with sustainable procurement practices. This project helped WCDSB in developing the next steps to review and revise its procurement practices.

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APPENDICES

APPENDIX A: PROFILE OF WCDSB BUILDINGS

Building Name	Building ft²	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. Agatha (closed 2017, sold 2020)	17,953	1955
St. Agnes	25,909	1956z
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	22,162	1898
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. Francis	27,882	1968
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. Louis Adult Learning & Continuing Education Centre (St. Francis Campus, closed 2019 - 2020)	14,651	1958
St. Louis Adult Learning & Continuing Education Centre	83,642	1957
St. Don Bosco Alternative Education (St. Mary's West Campus)	20,204	1965
St. Don Bosco	2,475	1974
Administrative Buildings		
WCDSB Catholic Education Centre	112,136	1955
Facility Services	34,179	1979

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	$100,000	$815,000	$200,000
Exterior Lighting – LED retrofits	$17,959	$25,000	$25,000	$25,000	$25,000
HVAC					
Efficient Boilers (near condensing)	$90,000	$730,000	$390,000	$80,000	$320,000
Energy Efficient HVAC Systems	$1,990,000	$939,000	$1,190,000	$1,715,000	$1,460,000
Energy Efficient Rooftop Units	$-	$200,000	$180,000	$190,000	$140,000
High Efficiency Domestic Hot Water	$200,000	$30,000	$45,000	$240,000	$130,000
Energy Efficient Ventilation	$1,605,000	$975,000	$633,000	$590,000	$950,000
Controls and Automation					
Building Automation Systems – New	$80,000	$-	$-	$-	$-
Building Automation Systems – Upgrade	$60,000	$120,000	$-	$320,000	$130,000
Building Envelope					
New Roofing	$1,200,000	$850,000	$1,000,000	$1,900,000	$1,240,000
New Windows	$275,000	$-	$-	$-	$-
Total Investments	**$5,817,959**	**$4,129,000**	**$3,563,000**	**$5,875,000**	**$4,595,000**

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	$5,817,959	$4,129,000	$3,563,000	$5,875,000	$4,595,000
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	**$5,870,959**	**$4,134,000**	**$3,576,000**	**$5,888,000**	**$4,608,000**
Estimated Annual Energy Savings (ekWh)	**2,141,201**	**2,470,069**	**1,541,645**	**2,274,190**	**1,932,787**

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.

May 25, 2021

_____ _____

Shesh Maharaj — Date

Executive Superintendent of Corporate Services

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

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