



# Energy Conservation and Demand Management Plan 2024 to 2028

July 2024

Prepared in co-operation with:



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April 5, 2024

Randy Pearson  
Supervisor, Facility Operations  
360 Fairview Avenue West, Essex, Ontario

In the spirit of reducing the impact of rising energy costs, and in response to current regulatory requirements, County of Essex has developed a new 5-Year Energy Conservation and Demand Management (ECDM) Plan. This Plan outlines our progress against our previous 2019 Plan as well as our planned conservation actions forward to 2029. This new Plan and its related strategies and initiatives is supported by our senior management.

Our renewed Energy Conservation and Demand Energy Management Plan (ECDM Plan) has been updated in response to Ontario Regulation 25/23, requiring all public agencies to prepare, publish and implement an ECDM Plan. Our ECDM Plan fulfils the reporting requirements of the above regulations and provides a framework to support continued energy and sustainability initiatives within the built environment, operations and programs. The Plan further identifies opportunities for continued energy conservation measures and sustainability initiatives to build on our existing plans and conservation efforts. Implementation of all initiatives is subject to future funding availability and budget approvals.

Our ECDM Plan has also been developed to address the fiscal, societal, and environmental costs and risks associated with energy consumption. Appropriate energy management will permit our organization to display leadership, improve the delivery of services, and enhance the overall quality of life within our organization and the greater community.

Warmest regards,

*Randy Pearson*

Randy Pearson  
Supervisor, Facility Operations  
County of Essex

# Introduction – Executive Summary

## Background

The County of Essex’s Energy Conservation and Demand Management (ECDM) Plan was developed in response to Ontario Regulation 25/23 which requires all public sector organizations to complete an ECDM plan every 5 years. This 2024-2029 ECDM Plan is an update to the County’s previous 2019-2023 ECDM Plan submitted by July 1, 2024.

This ECDM Plan presents energy saving results achieved and the lessons learned since the previous plan, and lays out the goals, strategy, and the business case for energy efficiency investments over the next five years.

Energy conservation and demand management are critical considerations for municipal governments in Ontario, where institutions play a vital role in shaping a sustainable future. This review highlights the significance of implementing robust energy conservation and demand management strategies to address economic and environmental objectives. Beyond the economic benefits, these initiatives contribute to environmental stewardship, regulatory compliance, community relations, and the embracement of innovative technologies. By prioritizing energy conservation, municipal governments can fulfill their commitment to fostering a greener, more sustainable future for both current and future generations.

This comprehensive plan is the most effective method of identifying energy conservation opportunities, selectively implementing the best projects and then measuring their effectiveness. The Plan has been developed to protect the interests of our community, staff and residents while ensuring that the County of Essex obtains the best possible value from our operating budgets. The County remains committed to enhancing our efforts to conserve energy conservation while also reducing GHG emissions. We believe in becoming more sustainable with a view towards cost-effective actions that respects the value of tax-payer funding.

## The Objectives of our ECDM Plan

Our ECDM Plan aims to achieve several complimentary objectives:

1. Efficiency Improvement:
  - Enhance the efficiency of energy use across all facilities and operations to minimize waste and maximize output.
2. Cost Reduction:
  - Implement measures to reduce energy-related costs, ensuring fiscal responsibility and budget stability.
3. Environmental Sustainability:
  - Mitigate the organization's environmental impact by lowering carbon emissions and promoting sustainable energy practices.

#### 4. Compliance with Regulations:

- Adhere to relevant energy efficiency regulations, standards, and reporting requirements imposed by regulatory bodies.

By achieving these goals, the County will achieve a more energy efficient future while lowering its GHG Emissions and fulfilling its energy reduction and environmental sustainability objectives.

### **About the County of Essex**

Essex County is bounded on three sides by water – Lake Erie to the south, the Detroit River to the west and Lake St. Clair to the north. We are Ontario's warmest county and home to Point Pelee, the southernmost point of mainland Canada.

### **Purpose of the Plan**

The 5-Year Corporate Energy Conservation and Demand Management Plan is designed to guide towards a more sustainable future. The policies, practices and energy conservation measures identified in the plan illustrate the importance placed on acting responsibly towards energy consumption through the rational use of resources in operations.

To enhance our understanding of energy use and return on investment through conservation, this document contains a thorough review of the measures implemented since the creation of our previous plan, issued on July 1, 2019. Since then, the County of Essex has initiated several substantial energy projects, yielding significant savings results.

The results of these efforts are described in Section 1.0 of this document. Details on implemented projects can be found in Appendix B.

In addition, the County continues to embark on other environmental projects which have both direct and indirect effects on our energy conservation efforts.

The wise and efficient use of energy are two of the lowest cost options for reducing energy demands and controlling budgets. They also provide many other environmental, economic and social benefits, including reducing greenhouse gas (GHG) emissions, cost avoidance and savings in operations and maintenance costs. Along with the primary benefits, the responsible use of energy also promotes local economic development opportunities, energy system reliability, improved energy supply security and reduced-budget volatility.

Following the path of our previous ECDM Plan, this document is a continuation of a process involving the:

- Integration of establishing and evaluating a baseline for performance to be measured against

- Reviewing the effectiveness of previous conservation efforts while setting future performance goals and objective
- Continuous improvement through identification of energy conservation potential
- Strategic alignment of improvement measure implementation and fiscal constraints
- Evaluation, measurement, and communication of results achieved.

As with our previous plan, capital renewal projects and investments will continue to be viewed through an energy conservation and sustainability lens to achieve energy savings and reduced GHG emissions. High potential savings facilities will be prioritized where possible to achieve the largest conservation impacts.

The following report summarizes the significant efforts applied by Facilities and Capital Planning Teams to create a Plan that can be implemented responsibly, over time, to create lasting results. The Plan takes advantage of internal expertise as well as all available external financial incentives and rebates currently being offered to support the implementation of energy savings ideas. The energy picture for our future Vision, Goals and Objectives is shown in the Energy Conservation and Management Policy. Our strategic focus areas are discussed in detail and our 5-year Action Plan is laid out on a project-by-project basis.

## **Emerging Factors that Could Affect Energy Management**

There are several emerging key factors that could affect the Energy Management priorities during the period of this plan.

### *GHG Emissions Reduction and Electrification*

A greater push towards lowering GHG emissions has led to many public sector entities considering electrification of carbon-based processes (i.e., water heating, space heating). While moving these processes to electricity would provide the quickest emissions reductions, there are limitations of electrical capacity that could hamper such efforts. Energy budgeting would also have to be re-examined to capture the greater reliance on electricity. While the impact on GHG emissions has been considered for the measures suggested to be implemented as part of this plan, a full move to electrification is outside the scope of this plan.

Some of the current trends in this area that could affect future planning and implementation strategies are:

- A current trend towards the use heat pumps to replace conventional heating and cooling systems (a heat pump pulls heat from the cold outdoor air and transfers it indoors, and in warmer months, it pulls heat out of indoor air to cool. Powered by electricity, the units transfer heat using refrigerant to provide comfort all year round).

- Hybrid RTU (Dual fuel) to replace traditional natural gas rooftop units, all-electric refrigerant cooling, and heating with an auxiliary gas system.

The current global trend towards eliminating GHG emissions means that natural gas, which on average emits over 6 times more kgCO<sub>2</sub> than electricity, is being phased out as a fuel for both new builds and existing facilities. Currently, electricity is much more expensive per ekWh than natural gas. A rapidly increasing carbon tax could close this gap but the push to electrification could have a significant impact on future energy budgets.

### **A Note on Available Finances**

As with all municipal governments, the County of Essex receives 100% of its funding from the taxpayers. This funding is allocated on an annual basis and is not multi-year in nature. Therefore, while this plan envisions a 5-year implementation window, the County of Essex's ability to implement the plan in any year is largely dependent on available funding. County personnel regularly research and participate in various funding and incentive programs (where available and applicable) to help offset some of the cost of energy-conservation-related activities and retrofits.



## **1.0 Achievements over the Previous Plan Period**

As mentioned, the previous plan covered the period from fiscal year 2019 to 2023. During that time, our conservation goal was to reduce energy intensity by 5% over the baseline year (2019). The achievement of this goal was affected by the effects of the COVID-19 Pandemic and other mitigating factors.

The pandemic affected all aspects of local activities including energy management. These effects are noted below.

### **Historical Energy Usage**

Effectively managing energy requires strong and consistent energy monitoring combined with solid review procedures to create an accurate and appropriate energy baseline. A baseline allows for energy conservation and greenhouse gas reduction target setting, energy procurement and budgeting, bill verification, energy awareness, and the selection and assessment of potential energy projects. The County of Essex uses utility bills to establish this energy baseline.

In accordance with regulatory requirements, fiscal 2018 was chosen as the base year to evaluate the effectiveness of previous energy conservation measures. The County of Essex total consumption in 2023 was 4.8 million kWh of electricity and 762 thousand m<sup>3</sup> of natural gas. The breakdown of energy consumption is shown in the following figures. It is important to note that 2020 was a reduced year for energy consumption due to COVID-19 related restrictions for some of our facilities.

For comparative purposes, the raw energy consumption breakdowns by month since the original baseline for are as shown below. The previous plan's base year was 2018 and is shown below.

Figure 1-1: Electricity Use (2018 – 2023)

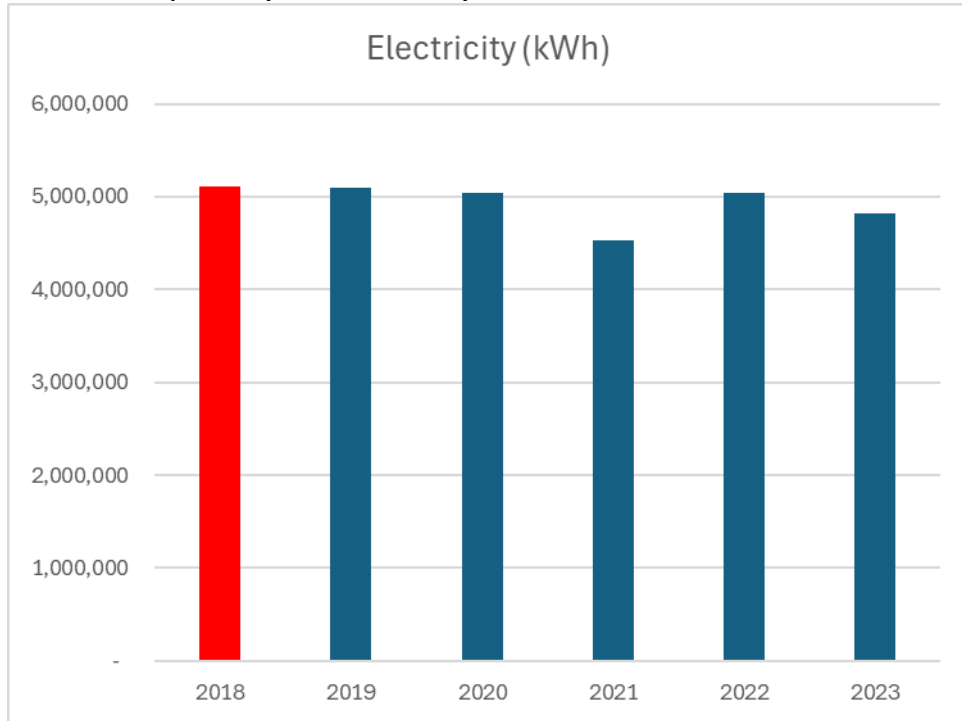
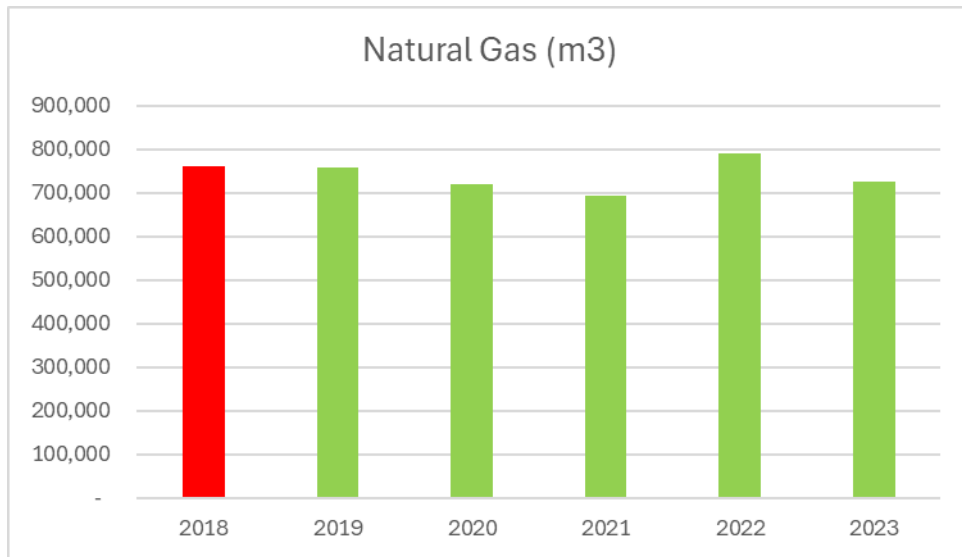


Figure 1-2: Natural Gas Use (2018 – 2023)



The review of this raw energy consumption data requires deeper analysis as the County's facility fleet footprint changes over time (usage changes, additions, facility closures and sales, etc.)

Table 1-1: Heating and Cooling Degree Days

	2018	2019	2020	2021	2022	2023
<b>HDD</b>	<b>3,537</b>	3,511	3,263	3,162	3,442	2,986
<b>CDD</b>	<b>522</b>	407	447	494	434	300

Source: weatherstats.ca

Heating (HDD) and Cooling (CDD) degree days have a significant impact on energy consumption as a large percentage of the energy consumption is affected. The higher the HDD value, the more heating is required. Similarly, CDDs affect energy use through increased air conditioning and other cooling-related equipment (fans, etc.). The figures shown above are calculated using local weather data. (HDD are the number of degrees that a day's average temperature is below 18C (the balance point) and CDD are the number of degrees that a day's average temperature is below 18C).

### Energy Baseline Analysis

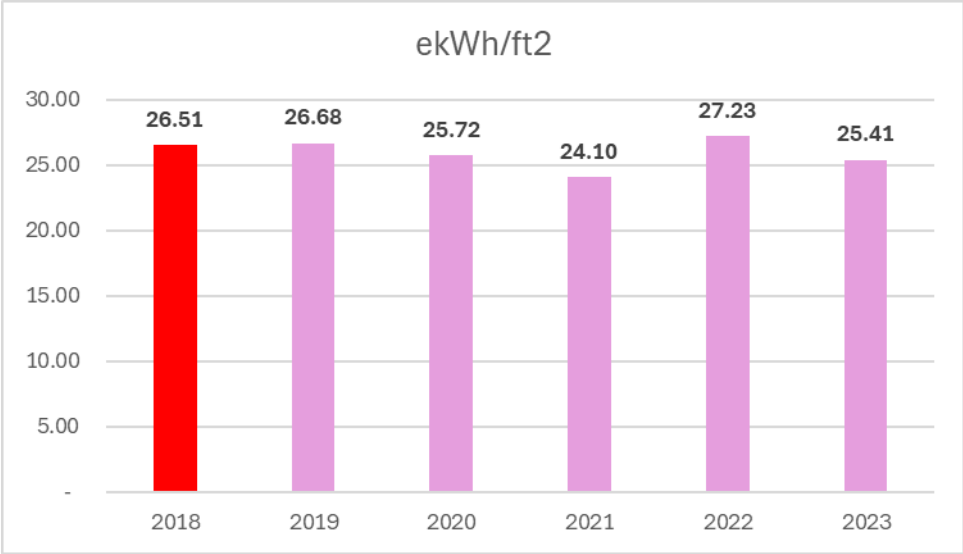
Starting with the previous ECDM plan, the County of Essex uses an analysis of energy intensity (ekWh/ft<sup>2</sup>) for the base year comparisons. The municipal sector is subject to significant year-to-year changes that can have a major impact on overall energy consumption over a five-year period. These variables can include major additions and renovations, sites sold/closed/demolished/leased, changes in equipment, and changes in use of space. This is why the ekWh/ft<sup>2</sup> metric is employed as it overcomes the changes in total building area managed. It is important to use a metric that recognizes these potential changes and reveals a fair and reliable comparison. A review of energy intensity or ekWh/ft<sup>2</sup> can help understand whether facilities are becoming more energy efficient, while reducing the statistical noise of changes in the overall size of the facility fleet.

Table 1-2: Changes in the facility fleet

	BASE YEAR	PLAN YEARS					
	2018	2019	2020	2021	2022	2023	% Change
ft <sup>2</sup>	<b>490,021</b>	484,957	484,957	484,957	484,957	484,957	-1%
m <sup>2</sup>	<b>45,524</b>	45,054	45,054	45,054	45,054	45,054	-1%
Facilities	<b>21</b>	20	20	20	20	20	-5%

In the previous ECDM Plan, a consumption reduction target of 5% for the 5 years of the ECDM Plan. The graph below illustrates that the ekWh/ft<sup>2</sup> energy intensity over the 5-year period has decreased by 0.51 kWh/ft<sup>2</sup> or 5% compared to the original base year of 2018 meaning that the County has reached its previous goal of a 5% reduction.

Figure 1-3: Energy Intensity (ekWh/ft<sup>2</sup>)



## **Energy Conservation Project Successes**

Since the creation of the last 5-Year ECDM Plan, the County of Essex has initiated important investments in energy efficiency and energy-cost reduction. These projects include:

- Lighting retrofits
- HVAC upgrades
- Building controls upgrades
- Energy monitoring system implementation
- Building envelope improvements

## **Facility-Related Projects**

Between Fiscal 2019 and 2023, many projects were undertaken that had a positive impact on energy consumption. Many of these items involved replacement of end-of-life equipment that was replaced under our capital renewal programs with more energy efficient alternatives. Available incentives were received to reduce additional costs incurred (above typical replacement value) to achieve this energy efficient status.

## **2.0 Energy Conservation and Management Policy**

### **Our Commitment**

The County of Essex remains committed to allocating staff and financial resources to develop and implement a strategic Energy Conservation and Demand Management (ECDM) Plan to reduce energy consumption and lessen its environmental impact. As an organization, we value the notion of protecting staff, resident and community interests through efficient operations and creating a more sustainable future.

We are committed to managing energy responsibly and will use energy efficiency practices throughout all our facilities, fleet, operations and equipment wherever it is cost effective to do so.

### **Our Vision**

The County of Essex will endeavour to minimize wasteful energy consumption, related costs, and carbon emissions by continuously improving its energy management practices without compromising the level of service delivery to the community.

### **Our Goals and Objectives**

As part of our 2024 ECDM Plan, several strategic avenues were created to achieve specific goals and targets with regards to energy management. We have re-examined our past objectives and are committing to this updated version.

1. Reduce energy intensity in our facilities by 5% by fiscal 2028 compared to our updated base year (2023).
2. Expand our culture of conservation through training and outreach to staff, residents and business partners. Residents, staff and stakeholders will be empowered to conserve energy and resources by providing appropriate training and timely, relevant data and information.
3. Review our energy management policy and practices and look for ways to enhance and inform our existing key business practices to include energy efficiency standards and energy management best practices.
4. Enhance our monitoring and tracking program for energy use by providing broader awareness and access to our energy management system to make energy use more visible to everyone and support decision-making.

5. Create energy savings by implementing up-to-date processes, programs and projects that will reduce energy consumption.
  - Identify and target the top energy consuming facilities across the Corporation. (On-going)
  - Review identified energy savings opportunities and plan for new energy audits and analysis of the capital asset renewal program to create an up-to-date list of actionable items. (On-going)
  - Review and/or enhance operating and maintenance procedures to include industry best practices and energy reducing methodologies. (On-going)
  - Obtain funding from various sources to enhance the payback and reduce implementation costs of energy conservation activities. (On-going)

## **Strategic Action Plan**

Our new ECDM Plan encompasses three strategic actions designed to ensure a positive outcome over the next 5 years. These important areas are designed to enhance and support the delivery of the ECDM Plan's Goals and Objectives.

### **Strategy 1. Corporate Practices**

Develop and implement policies and practices that support efforts to conserve energy conservation and reduce greenhouse gas emissions while illustrating leadership and commitment within the community.

- Energy Management Team: Roles, Responsibilities and Accountability
- Energy Procurement
- Life-cycle Cost Analysis
- Energy Policies and Procedures

### **Strategy 2. Education, Awareness & Outreach**

Provide guidance, leadership and framework necessary to empower employees and develop a culture of conservation.

- Energy Skills Training Program
- Energy Awareness Training
- Outreach, Engagement and Recognition Programs
- Feedback System for Resident/Staff/Stakeholder Suggestions
- Staff Brainstorming Sessions

### **Strategy 3. Energy Conservation Action Plan and Energy Information Management**

Continually identify and deliver energy conservation processes, programs and projects in all areas (facilities, fleet, equipment, etc.). Demonstrate sound operating and maintenance practices to complement the energy efficiencies implemented

through the capital asset renewal program. Employ a robust Energy Information Management System to ensure that all conservation activities are measured and verified to guarantee the County of Essex receives and maintains specified energy reductions and savings.

### **Energy Conservation Action Plan**

- Key facility energy audits and facility re-commissioning
- Asset renewal plan and energy conservation project delivery
- Standard facility operations procedure review

### **Energy Information Management**

- Maintenance of the online energy monitoring and reporting system (electricity, natural gas and fuels)
- Expand the use and availability of our electricity, natural gas and water monitoring systems.
- Regular Energy Use Review presentations for the staff, residents, senior leadership, accountable staff and energy users
- Energy bill verification and rate optimization
- Reporting requirements for Regulation 25/23 (formerly 507/18 and 397/11)
- Consistent updates and review of key performance indicators (KPIs) / benchmarking
- Standardize and implement project measurement and verification;



## **STRATEGY 1: Energy Management Corporate Practices**

The County of Essex has implemented essential practices, including key personnel deployment, to ensure a strong focus on energy management and savings. These efforts remain a key component of our renewed ECDM Plan.

### **The Energy Management Team: Roles and Responsibilities**

#### **Energy Champion: Supervisor, Facility Operations**

The Energy Champions have direct knowledge of the organization's major energy-using systems and are responsible for developing and maintaining the focus for the Energy Management Team. This role is responsible for setting and/or legitimizing the program's high-level goals and objectives, keeping track of major project activities and approving resources and funding for the team and its approved projects. The Energy Champions coordinate meetings, set agendas, and delegate and manage tasks related to the Energy Management Team. This role also helps create the vision for the program and will help the program maintain momentum particularly when barriers arise. The Energy Champions are also responsible for ensuring that the monitoring and tracking systems for energy are accurate, up-to-date and available for use by the employees.

#### **Energy Management Team**

The Energy Management Team functions on a strategic level to set expectations for each of the facilities, develop metrics for tracking overall energy improvement, and build accountability for energy management activities. In addition, this cross-functional team has direct responsibility for the consumption of energy within their respective departments. As a group, the team supports and monitors the energy management initiatives (processes, programs, and projects) at various facilities and across the Corporation.

**Actions:** Continue to seek cross-departmental membership and support for the Energy Management Team. Continue to meet regularly to discuss the Energy Management Program to ensure implementation of new savings ideas, as well as maintain the positive momentum built over the past 5 years.

#### **Energy Procurement**

The County of Essex continues to utilize the electricity and natural gas procurement service provided by LAS. This program provides options for fixed-price energy procurement services permitting the County to maintain predictable electricity and natural gas commodity costs. In addition, the program permits working together with many other municipal-related entities throughout the province to create bulk-buying power to leverage aggregated energy purchasing opportunities.

**Actions:** Continue to review the program annually and evaluate the level of participation. Review potential alternative programs and analyze the net result of participation annually.

### **Life-Cycle Cost Analysis**

Life-Cycle Cost Analysis considers the full cost of procuring, operating and maintaining any given solution or system. By reviewing this 'initial cost and total cost to operate and maintain' scenario, a broader view of the overall cost of procurement will be uncovered, making more informed, effective, and efficient long-term decisions.

This outlook will also help to implement GHG emissions reduction strategies. For example, the initial cost of installing a heat pump system may be higher than traditional heating and cooling systems. However, it is important to consider the long-term cost savings over the life cycle of the system due to the increasing cost of fossil-based fuels. Since natural gas emits over six times more kgCO<sub>2</sub> than electricity, the introduction of heat pumps will help to achieve the

**Actions:** Review the overall life-cycle costs when procuring to ensure the lowest overall costs and improve the effectiveness of our procurement decision-making.

### **Energy Policies and Procedures**

The County of Essex has promoted energy reduction policies and practices where possible. These include guidelines regarding turning off lights and equipment when not in use as well as Occupied/Unoccupied temperature settings and hot water heating temperature limits. A Comprehensive Energy Policy Framework is found in Appendix G. The County of Essex plans to begin implementing areas of effective energy management policy through the term of this Plan. Our Energy Management Policy will underscore our commitment to fostering a sustainable and energy-efficient environment within our facilities. Through collaboration, education, and innovative solutions, we aim to reduce our energy consumption and contribute to a greener and more sustainable future for our staff and community.

**Actions:** Continue to evolve our Comprehensive Energy Management Policy to improve our practices including internal responsibility, energy conservation measures, monitoring and reporting, communication and outreach as well as our compliance and review strategies. These practices include developing energy efficient purchasing policies as well as guidelines for including energy efficient solutions above standard practice for any construction projects (new, additions and renovations) where practical.

## **STRATEGY 2: Education, Awareness and Outreach**

The Education, Awareness and Outreach program has been utilized over the past 5 years to assist with the maintenance of our culture of conservation. This has been achieved by raising the level of awareness, understanding and general knowledge amongst staff regarding energy spending, usage and conservation. The County will continue to utilize a successful combination of program engagement, direct awareness marketing and hands-on training to enhance our energy reduction efforts to support the achievement of our energy conservation goals and objectives. As well, energy will continue to be a regular agenda item at staff meetings to solicit new ideas for reduction of energy use, promote continued awareness of the cost of energy and ensure that energy conservation remains a key consideration for all staff, residents and stakeholders.

The Education, Awareness and Outreach program provides guidance, leadership and the framework to empower all stakeholders and foster our culture of conservation. The program informs in terms of current energy use, operational practices as well as improvement opportunities, ensuring staff and residents are informed of our energy reduction efforts. This continued practice will foster the greatest possible impact of education and awareness.

The program is comprised of the following four focus areas:

### **Energy Skills Training Program**

The Energy Skills Training Program assists to develop staff awareness and understanding of energy use in facilities and provides knowledge to identify opportunities for improvement. The Training Program combines both general knowledge training and hands-on experience.

### **Outreach, Engagement, Recognition and Energy Awareness Training Program**

The County of Essex will continue to engage all users of our facilities (staff and residents) and recognizes that this is essential to the continued success of the energy management program. Our energy program will continue to employ a comprehensive approach to both engaging employees and recognizing the efforts of people who provide important support and ideas.

Energy will remain a key element for management and staff meetings to ensure that the topic remains top of mind. Brainstorming Sessions remain an important element of our ECDM Plan as they are a key element to generate ideas for energy conservation and pathways for implementation. Our staff and stakeholders are one of our most valuable resources to both generate and implement our energy conservation strategies.

## Communication Plan

The County of Essex will implement a communication plan to disseminate information regarding the Plan, Key Milestone achievement and other important information regarding our energy conservation journey. This Plan covers both internal and external stakeholders as well as the general public. It will cover a variety of methods including traditional and social media and is contained within Appendix C.

## Feedback System for Staff/Resident/Stakeholder Suggestions

The County of Essex will employ a feedback system to allow residents, staff and stakeholders to address concerns and provide input and ideas. Feedback will be obtained through a variety of electronic means including social media and email. Any messages received will be forwarded to members of the Energy Management Team for a timely response. The Energy Team members can involve appropriate employees to ensure that all ideas are captured and investigated.

**Actions:** Review available energy training opportunities both generally (i.e., all staff) and for specific facilities staff. Establish and maintain at least annual Outreach and Engagement efforts to keep energy conservation 'top-of-mind' for staff and stakeholders.

## **STRATEGY 3: Energy Conservation Activities and Information Management**

### **Energy Conservation Action Plan**

The Energy Conservation Action Plan (Appendix A) is the implementation pathway for energy and cost saving measures. The County of Essex has compiled several high-potential projects based on capital plans and previous facilities' reviews. This action plan will be the guide for our conservation journey over the next 5 years based on a prioritized implementation schedule. All incentives and funding sources will be investigated to reduce the implementation cost of each measure. Further energy audits and studies, completed during the scope of this plan, will allow for innovative new energy conservation measures to be included.

Appendix A also contains a breakdown of measures. The strategy also highlights the measures that will be completed as part of our on-going maintenance program along with measures that were disqualified and those requiring further investigation to determine feasibility.

The measures will achieve (a detailed list of measures can be found in Appendix A):

- Improved facility functionality and occupancy comfort
- Reduced maintenance requirements
- Energy savings

Additional measures will be added as funding becomes available on an annual basis. Based on industry evaluations, these measures are expected to yield the following results:

- Education, Awareness and Outreach: 1-2% annual energy savings
- On-going regular reviews of consumption and baselines: 0.5 to 1% annual energy savings
- Re/retro Commissioning: 2-7% annual energy savings within the facilities where it is implemented (estimated to be 1% overall potential total annual savings)

**Actions:** Maintain an up-to-date prioritized list of energy conservation projects which will be augmented by renewed energy audits and studies. This process ensures that our measures are relevant and up-to-date and will also allow for evaluation of the effectiveness of implemented measures. Periodic reviews of available incentives and stay up to date on potential sources of money as these change regularly and often have limited time and funding. Review the list of measures at least annually and update, as necessary.

## Energy Information Management

### Online Energy Monitoring and Reporting System

The County of Essex utilizes an online system for managing and reporting on its energy consumption (electricity, natural gas, fuels and water). The motivation for this effort is the notion that “you can’t manage what you are not aware of”. Energy usage needs to be visual, timely and broadly accessible to all personnel. Staff benefit from understanding energy use in their facilities, as well as the impact their actions or inactions have on the overall energy cost and budgeting. This information is key in evaluating the potential of new conservation projects as well as measuring the effectiveness of initiatives already taken.

**Actions** Ensure energy data is loaded into the Energy Information Management System in a timely and accurate manner. Use the data for regular analysis of usage patterns and savings opportunities. Use the data to optimize building operation and to ensure that measures implemented remain in place and effective. Consider platforms such as RETScreen to strategically measure facility performance and ensure achievement of specified and expected savings and value-for-money from energy reduction initiatives. This reporting can be used to enhance energy skills training programs.

### Energy Management Presentations for the Staff, County Council and Other Stakeholders

To gain traction for the initiatives within this plan and ensure that the County reaches its stated reduction targets, it is imperative that information regarding energy usage and cost, as well as the energy conservation plans and projects, are well understood and front of mind of everyone from staff to senior department heads and County officials. This broad awareness will lead to additional buy-in and support for our continued efforts to reduce its energy usage and spending.

**Actions:** Make energy a key topic at staff and senior management meetings as well as provide an update on energy use and conservation at least annually.

### Key Performance Indicators (KPI’s) and Monitoring and Verification

KPIs and targets provide a comprehensive framework for evaluating, monitoring, and reporting on the effectiveness of implemented strategies within an Energy Conservation and Demand Management Plan. Regularly reviewing these metrics will help the organization stay on track, identify areas for improvement, and demonstrate its commitment to sustainable practices.

To ensure the County of Essex receives value-for-money with regards to its energy conservation efforts, a rigorous program of establishing and monitoring KPI’s is an essential element of all ECDM Plans. Using KPI’s for regular and frequent analysis

will allow staff to verify that savings expected from various projects are achieved as well as ensure the outcomes and savings continue for the duration of the project or retrofit's useful life. This practice will protect our investments as well as provide transparency and support for successful savings initiatives.

A comprehensive list of suggested KPIs is found in Appendix F.

**Actions:** Establish relevant and effective KPI strategy and make them part of a regular management review process. Assess all conservation initiatives to create an appropriate measurement and verification process. Report outcomes regularly to senior management/Energy Management Team.

### **Bill Verification and Rate Optimization**

A consistent, periodic review of energy invoices is important to ensure that rates and recorded consumption values on energy bills are accurate. This ensures that the invoices presented by utilities are correct and provide appropriate and relevant data to the Energy Management Platforms.

**Actions:** Perform a rationalization check on monthly invoices and conduct at least annual detailed billing reviews to ensure accuracy.

### **Ongoing Ontario Regulation 25/23 Reporting**

In addition to completing this Plan, the County is required to submit annual energy consumption and greenhouse gas emissions templates to the appropriate Ministry of Energy portal. Gathering and recording monthly energy invoices are necessary to complete these reports.

**Actions:** Complete all required regulatory reporting by July 1 of each year.

## **APPENDIX A: Future Energy Conservation Action Plan Measures Summary**

2024 – CIVIC CENTRE - HR / Housing Supports Office and the Cafeteria on the 1st Floor will receive new VAV Boxes and Lighting controls using their O3 for occupancy and lighting control. Lighting upgrade to LED.

2025 – CIVIC CENTRE - Potential renovation to 2nd Floor Conference Rooms, the previous Planning and Communication Office and former Housing with Supports office to replace VAV Boxes and Lighting Controls using the Delta O3 system. Lighting upgrade to LED.



## **APPENDIX B: Previous Energy Conservation Measures**

2019 – CIVIC CENTRE - IT Office on the ground floor was renovated with new Delta controls for VAV Boxes and lighting controls. Replaced fluorescents with LED – same LED Fixtures we used in the 2018 renovations Lutron.

2022 – CIVIC CENTRE - Administration and Finance area renovated including a lighting retrofit to LED. This complete area covers the existing administration office as well as the previous Engineering Office on the 1st floor. Delta supplied new VAV Boxes and Lighting controls using their O3 for occupancy and lighting control.

New VAV Boxes and Controls from Delta were installed in the separate Essex Windsor Solid Waste Authority Office.

2022 – CIVIC CENTRE - Delta installed the Coppertree Energy Management System to collect Data on energy usage.

2023 – CIVIC CENTRE - Contracted Coppertree (Kaizen) monitor and provide analytical data on the energy usage and any action to reduce usage.

## **APPENDIX C: Communication Plan**

### **A. Internal Communication Plan**

1. Objectives: a. Ensure all internal stakeholders are informed about the Energy Conservation and Demand Management (ECDM) Plan. b. Foster a culture of energy conservation and sustainability within the organization.
2. Target Audience: a. Employees at all levels b. Management and leadership teams c. Department heads and team leaders
3. Communication Channels: a. Regular Email Updates: Provide periodic updates on the progress, achievements, and upcoming initiatives through company-wide emails. b. Intranet Portal: Create a dedicated section on the company's intranet for ECDM-related information, resources, and updates. c. Staff Meetings: Incorporate ECDM updates and discussions into regular team and department meetings. d. Training Sessions: Conduct workshops and training sessions to educate employees on energy conservation practices and the importance of their role in achieving the goals.
4. Key Messages: a. Emphasize the importance of individual and collective efforts in achieving energy conservation goals. b. Highlight success stories and positive impacts of implemented measures. c. Clarify roles and responsibilities regarding energy-efficient practices.
5. Feedback Mechanisms: a. Establish suggestion boxes or digital platforms for employees to share ideas and feedback. b. Conduct periodic surveys to gauge employee awareness and engagement levels.

### **B. External Communication Strategies**

1. Objectives: a. Increase awareness of the organization's commitment to energy conservation and sustainability. b. Build positive relationships with external stakeholders, including customers, suppliers, and the local community.
2. Target Audience: a. Clients b. Suppliers and partners c. Local community and residents d. Regulatory bodies and government agencies
3. Communication Channels: a. Press Releases: Issue press releases to announce key milestones, achievements, and initiatives related to the ECDM Plan. b. Website and social media: Maintain an updated section on the company website and leverage social media platforms to share ECDM updates and success stories. c. Newsletters: Include ECDM updates in regular newsletters sent to clients, partners, and other stakeholders. d. Public Events: Participate in or host events focused on sustainability and energy conservation, showcasing the organization's commitment.

4. Key Messages: a. Demonstrate the organization's dedication to environmental responsibility. b. Share quantifiable results and positive impacts on the community. c. Encourage collaboration with partners and stakeholders for a collective impact.

5. Feedback Mechanisms: a. Establish contact points for external stakeholders to provide feedback or seek information. b. Use surveys and feedback forms to assess external stakeholder perceptions.

### **C. Stakeholder Engagement Programs**

1. Objectives: a. Foster collaboration and input from key stakeholders in the development and implementation of the ECDM Plan. b. Build a network of support for energy conservation initiatives.

2. Key Stakeholders: a. Local community organizations b. Environmental NGOs c. Industry associations d. Government agencies and regulators

3. Engagement Activities: a. Stakeholder Workshops: Organize workshops to gather input, feedback, and insights from key stakeholders on energy conservation strategies. b. Collaboration with NGOs: Partner with environmental NGOs for joint initiatives and community outreach programs. c. Advisory Boards: Form advisory boards with representatives from key stakeholders to provide ongoing guidance on ECDM initiatives.

4. Communication Channels: a. Dedicated Meetings: Schedule regular meetings with key stakeholders to discuss progress, challenges, and future plans. b. Collaborative Platforms: Utilize digital platforms for ongoing communication and collaboration with external stakeholders. c. Public Forums: Host public forums to engage with the community and address concerns.

5. Key Messages: a. Emphasize the collaborative nature of the ECDM efforts. b. Highlight the positive impact of stakeholder contributions on the community and the environment.

6. Feedback Mechanisms: a. Implement feedback loops to ensure continuous improvement based on stakeholder input. b. Regularly communicate the outcomes of stakeholder engagement activities.

This Stakeholder Engagement and Communication Plan aims to ensure transparency, accountability, and active participation from both internal and external stakeholders in the organization's energy conservation and demand management efforts.

## **APPENDIX D: SUGGESTED KPIS**

### **1. Energy Consumption KPIS:**

- a) Total Energy Consumption: Measure the overall energy consumption in kWh or MMBtu.
- b) Energy Intensity: Calculate energy consumption per unit of production or activity to assess efficiency improvements.
- c) Peak Demand: Monitor and manage the highest level of energy demand to avoid unnecessary costs and strain on the grid.

### **2. Cost-Related KPIS:**

- a) Energy Cost Savings: Evaluate the financial savings achieved through energy conservation measures.
- b) Return on Investment (ROI): Assess the profitability of implemented strategies by comparing savings to the initial investment.
- c) Payback Period: Determine the time it takes for the organization to recoup the initial investment in energy efficiency projects.

### **3. Environmental Impact KPIS:**

- a) Greenhouse Gas Emissions: Measure and track the reduction in carbon emissions resulting from energy conservation efforts.
- b) Carbon Intensity: Assess the amount of carbon emissions per unit of production or activity.
- c) Renewable Energy Integration: Monitor the percentage of renewable energy sources in the overall energy mix.

### **4. Operational Efficiency KPIS:**

- a) Equipment Utilization: Evaluate the efficiency of equipment and systems through utilization metrics.
- b) Downtime Reduction: Measure the reduction in downtime resulting from improved equipment maintenance and energy efficiency.
- c) Operational Productivity: Assess the impact of energy conservation measures on overall operational productivity.

### **5. Employee Engagement KPIS:**

- a) Training Participation: Track the number of employees participating in energy conservation training programs.
- b) Behavioral Changes: Monitor and assess changes in employee behavior related to energy conservation.
- c) Employee Suggestions: Evaluate the number and quality of suggestions submitted by employees for energy-saving practices.

## **6. Technology Adoption KPIs:**

- a) Energy Management System (EMS) Effectiveness: Assess the performance and impact of the EMS on energy consumption.
- b) Smart Technology Integration: Measure the successful integration of smart technologies for energy monitoring and control.
- c) Adoption of Energy-Efficient Technologies: Track the implementation and effectiveness of energy-efficient technologies and retrofits.

## **7. Renewable Energy Generation KPIs:**

- a) Renewable Energy Capacity: Monitor the installed capacity of renewable energy sources (solar, wind, etc.).
- b) Renewable Energy Generation: Measure the actual energy output from renewable sources.
- c) Grid Independence: Evaluate the organization's progress towards reducing dependence on the grid through renewable energy.

## **8. Regulatory Compliance KPIs:**

- a) Compliance with Energy Efficiency Standards: Ensure adherence to local, regional, and national energy efficiency standards and regulations.
- b) Reporting Timeliness: Assess the organization's ability to submit required energy-related reports in a timely manner (i.e. O. Reg. 25/23 Annual reporting)

## **9. Stakeholder Satisfaction KPIs:**

- a) Internal Stakeholder/Staff/Management Perception: Measure satisfaction regarding the organization's commitment to energy conservation.
- b) External Stakeholder/Community Feedback: Collect and analyze feedback from the local community on the organization's sustainability efforts.

## **10. Continuous Improvement KPIs:**

- a) Implementation of Recommendations: Track the integration of recommendations from energy audits and performance reviews.
- b) Iterative Goal Setting: Assess the organization's ability to set and achieve increasingly ambitious energy conservation goals.

## **11. Risk Mitigation KPIs:**

- a) Contingency Plan Activation: Monitor the activation and effectiveness of contingency plans in response to unforeseen challenges.
- b) Risk Reduction: Assess the success of risk mitigation strategies in minimizing potential disruptions to energy conservation initiatives.

## **12. External Recognition and Certifications:**

- a) Energy Star Certification: Pursue and monitor the organization's eligibility for Energy Star certification.
- b) Other Industry Certifications: Explore and pursue relevant industry-specific certifications for energy efficiency (e.g. LEED, BOMA Best, etc.)

# **APPENDIX E: SUGGESTED COMPREHENSIVE ENERGY MANAGEMENT POLICIES**

## **1. Policy Statement**

The County of Essex is committed to implementing effective energy management practices to reduce energy consumption, lower operational costs, and promote environmental sustainability. This Energy Management Policy outlines the strategies, responsibilities, and guidelines for achieving energy efficiency and conservation across all facilities.

## **2. Objectives**

- a) Energy Efficiency: Strive to improve the energy efficiency of all facilities and operations to reduce overall energy consumption.
- b) Cost Reduction: Implement measures to optimize energy use and reduce operational costs associated with energy consumption.
- c) Environmental Sustainability: Foster a culture of environmental responsibility by minimizing the ecological footprint through energy conservation initiatives.
- d) Education and Awareness: Promote energy conservation education and awareness among residents, staff, and the broader community.

## **3. Responsibilities**

- a) County Councilors:
  - Approve and support the implementation of energy management initiatives.
  - Allocate resources for energy efficiency projects.
  - Review and assess the progress of energy conservation efforts.
- b) Superintendent and Senior Leadership Team:
  - Appoint an Energy Manager or designate responsible for overseeing the implementation of the Energy Management Policy.
  - Support the integration of energy management into the overall strategic planning.
- c) Energy Manager or Designate:
  - Develop and implement an Energy Conservation and Demand Management Plan.
  - Monitor and analyze energy consumption data regularly.
  - Identify and prioritize energy-saving initiatives.
  - Collaborate with facility managers to implement energy efficiency measures.
  - Provide regular reports on energy performance to the County Council.

d) Facility Managers:

- Implement energy-efficient practices within their respective facilities.
- Support energy conservation education and awareness initiatives.
- Report any energy-related issues to the Energy Manager.

e) Staff:

- Integrate energy conservation education into the curriculum where applicable.
- Encourage residents to adopt energy-efficient behaviors.

f) Residents:

- Participate in energy conservation programs and initiatives.
- Adopt energy-efficient behaviors at home.
- Report on energy-related issues to County staff.

#### **4. Energy Conservation Measures**

a) Facility Upgrades:

- Implement energy-efficient lighting systems.
- Upgrade HVAC systems to maximize efficiency.
- Install programmable thermostats and smart building technologies.

b) Renewable Energy:

- Explore and implement renewable energy sources such as solar panels.
- Collaborate with local authorities to assess the feasibility of renewable energy projects.

c) Behavioral Change Programs:

- Conduct energy conservation awareness campaigns for residents, staff, and other stakeholders.
- Establish energy-saving competitions and recognition programs.

d) Training and Professional Development:

- Provide training for staff on energy-efficient practices and the use of energy-saving technologies.

#### **5. Monitoring and Reporting**

a) Regular Audits:

- Conduct regular energy audits to identify opportunities for improvement.
- Evaluate the effectiveness of implemented measures.

b) Performance Metrics:

- Establish key performance indicators (KPIs) to monitor and measure energy consumption, cost savings, and environmental impact.



c) Annual Reports:

- Prepare and present an annual report outlining energy performance, achievements, and future goals.

## **6. Communication and Outreach**

a) Communication Strategy:

- Develop a communication plan to inform the community about energy conservation initiatives and progress.

b) Community Engagement:

- Collaborate with parents, local businesses, and community organizations to enhance energy conservation awareness.

## **7. Compliance and Review**

a) Compliance:

- Ensure adherence to relevant energy efficiency regulations and standards.

b) Policy Review:

- Periodically review and update the Energy Management Policy to reflect advancements in energy management practices and technologies.

## **8. Conclusion**

This Energy Management Policy underscores our commitment to fostering a sustainable and energy-efficient environment within its facilities. Through collaboration, education, and innovative solutions, we aim to reduce our energy consumption and contribute to a greener and more sustainable future for our community.

# APPENDIX F: ONTARIO REGULATION 25/23

Ontario regulation 25/23

made under the

## ELECTRICITY ACT, 1998

Made: February 23, 2023

Filed: February 23, 2023

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### **BROADER PUBLIC SECTOR: ENERGY REPORTING AND CONSERVATION AND DEMAND MANAGEMENT PLANS**

#### Definitions

1. In this Regulation,

“municipal service board” means,

- (a) a municipal service board or joint municipal service board established or continued under the *Municipal Act, 2001*,
- (b) a city board or joint city board established or continued under the *City of Toronto Act, 2006*, or
- (c) a joint board established in accordance with a transfer order made under the *Municipal Water and Sewage Transfer Act, 1997*; (“commission de services municipaux”)

“Portfolio Manager” means the ENERGY STAR Portfolio Manager electronic reporting system developed by the United States Environmental Protection Agency, as adapted for use in Canada and administered by Natural Resources Canada, and available on the Internet; (“Portfolio Manager”)

“post-secondary educational institution” means a university in Ontario, a college of applied arts and technology in Ontario or another post-secondary educational institution in Ontario, if the university, college or institution receives an annual operating grant; (“établissement d’enseignement postsecondaire”)

“public hospital” means a hospital within the meaning of the *Public Hospitals Act*; (“hôpital public”)

“school board” means a board within the meaning of the *Education Act*. (“conseil scolaire”)

#### Prescribed public agencies

2. For the purposes of the definition of “public agency” in subsection 25.35.2 (1) of the Act, the following are prescribed as public agencies:

1. Every municipality.
2. Every municipal service board.
3. Every post-secondary educational institution.
4. Every public hospital.
5. Every school board.

#### Plan

3. (1) Every public agency that is not a ministry of the Government of Ontario shall prepare an energy conservation and demand management plan.

(2) The energy conservation and demand management plan shall be approved by the senior management of the public agency to whom the plan applies before the public agency publishes the plan on the public agency’s website and makes the plan available to the public in printed form at the public agency’s head office in accordance with section 9.

#### Plan, prescribed operations

4. The operation, by a public agency, of a building or facility referred to in Table 1 for that type of public agency is prescribed as an operation for the purposes of paragraphs 1 and 2 of subsection 25.35.2 (3) of the Act.

**Plan, prescribed additional information**

5. (1) The following information is prescribed, for the purposes of paragraph 4 of subsection 25.35.2 (3) of the Act, as additional information the energy conservation and demand management plan must include:

1. A summary of annual greenhouse gas emissions for each of the public agency's prescribed operations, which shall be included in the summary of the public agency's annual energy consumption required under paragraph 1 of subsection 25.35.2 (3) of the Act.
2. A description of the results of previous activities and measures to conserve the energy consumed by the public agency's prescribed operations and to otherwise reduce the amount of energy consumed by the public agency, including by employing such energy conservation and demand management methods as may be prescribed.
3. The cost and saving estimates for the public agency's current and proposed activities and measures referred to in paragraph 2 of subsection 25.35.2 (3) of the Act.
4. A description of any renewable energy generation facility operated by the public agency and the amount of energy produced on an annual basis by the facility.
5. A description of,
  - i. the ground source energy utilized, if any, by ground source heat pump technology operated by the public agency,
  - ii. the solar energy utilized, if any, by thermal air technology or thermal water technology operated by the public agency, and
  - iii. the proposed plan, if any, to operate heat pump technology, thermal air technology or thermal water technology in the future.
6. The estimated length of time the public agency's current and proposed activities and measures referred to in paragraph 2 of subsection 25.35.2 (3) of the Act will be in place.
7. A confirmation that the energy conservation and demand management plan has been approved by the public agency's senior management.

(2) The energy conservation and demand management plan may also include information on the operation of a building or facility by the public agency that is not a prescribed operation for that public agency.

**Summary, prescribed operations of certain buildings or facilities**

6. (1) The information required under section 7 for each of the public agency's prescribed operations is required only if the public agency owns or leases the building or facility whose operation is prescribed and,

- (a) the building or facility is heated or cooled and the public agency is issued the invoices and is responsible for making the payments for the building or facility's energy consumption; or
- (b) the operation is related to the treatment of water or sewage, whether the building or facility is heated or cooled, and the public agency is issued the invoices and is responsible for making the payments for the building or facility's energy consumption.

(2) If only part of the building or facility is heated or cooled, the public agency is only required to include the information required under section 7 for the part of the building or facility that is heated or cooled.

**Summary, prescribed requirements**

7. (1) The summary of annual energy consumption required under paragraph 1 of subsection 25.35.2 (3) of the Act and the summary of annual greenhouse gas emissions required under paragraph 1 of subsection 5 (1) of this Regulation shall be for the year that ends on December 31 immediately preceding the day the summary is required to be submitted.

(2) The summary for a year must include the following information for each of the public agency's prescribed operations:

1. The name of the building or facility.
2. The address of the building or facility.
3. The total floor area of the indoor space of the building or facility.
4. The type of the building or facility, as set out in a paragraph in Column 2 of Table 1.
5. If the building or facility has more than one use, the type of the building or facility for the purpose of paragraph 4 shall be determined based on the use that occupies the largest amount of total floor area of the indoor space

or, if more than one use occupies the same amount of total floor area of the indoor space, based on one of those uses chosen by the public agency.

6. A description of the days and hours in the year during which the building or facility is operated and, if the building or facility is operated on a seasonal basis, the period or periods during the year when it is operated.
  7. The total amount of each type of energy that was consumed in the year to operate the building or facility and that was purchased by the public agency, regardless of when it was purchased.
  8. The total amount of greenhouse gas emissions that were emitted in the year with respect to each type of energy, calculated from the total amount of each type of energy included under paragraph 7.
- (3) The summary for a year must also include the following information, if applicable:
1. If the public agency is a school board whose operation of a school is prescribed,
    - i. whether the school had classrooms in temporary accommodations and the number of such classrooms, and
    - ii. whether the school had an indoor swimming pool.
  2. If the public agency is a public hospital whose operation of a facility used for hospital purposes is prescribed, whether the facility was operated as a chronic or acute care facility, or both.
  3. If the public agency is a municipality or municipal service board whose operation of a building or facility related to the treatment of water or sewage is prescribed,
    - i. the volumetric flow rate of water treated, if the building or facility treats water, or
    - ii. the volumetric flow rate of sewage treated, if the building or facility treats sewage.
- (4) A public agency may exclude, from the summary, any amount of energy consumed or greenhouse gas emitted related to the temporary use of an emergency or back-up generator to continue the operation of the building or facility.
- (5) In this section,

“volumetric flow rate” means a rate that sets out the flow of water or sewage in units of volume over time.

**Summary, submission to Ministry**

- 8.** (1) Each year, every public agency shall submit to the Ministry, through the use of Portfolio Manager, the summaries referred to in subsection 7 (1).
- (2) The summaries for a year ending December 31 shall be submitted on or before July 1 of the following year.
- (3) Despite subsection (2),
- (a) the summaries for the year ending December 31, 2021 shall be submitted on or before July 1, 2023; and
  - (b) the summaries for the years ending December 31, 2022 and December 31, 2023 shall be submitted on or before July 1, 2024.

**Plan, publication**

- 9.** (1) On or before July 1, 2024 and on or before July 1 in every fifth year thereafter, every public agency shall publish on its website, and make available to the public in printed form at its head office, the public agency’s energy conservation and demand management plan.
- (2) The reference to the plan in subsection (1) does not include the summaries referred to in subsection 7 (1), other than the summaries for the most recent year before the applicable due date referred to in subsection (1).

**Revocation**

**10. Ontario Regulation 507/18 is revoked.**

**Commencement**

**11. This Regulation comes into force on the day it is filed.**

TABLE 1

Item	Column 1 Type of Public Agency	Column 2 Buildings and Facilities Whose Operation is Prescribed
1.	Municipality	1. Administrative offices and related facilities, including municipal council chambers. 2. Public libraries. 3. Cultural facilities, indoor recreational facilities and community centres, including art galleries, performing arts facilities, auditoriums, indoor sports arenas, indoor ice rinks, indoor swimming pools, gyms and indoor courts for playing tennis, basketball or other sports. 4. Ambulance stations and associated offices and facilities. 5. Fire stations and associated offices and facilities. 6. Police stations and associated offices and facilities. 7. Storage facilities where equipment or vehicles are maintained, repaired or stored. 8. Buildings or facilities related to the treatment of water or sewage. 9. Parking garages.
2.	Municipal service board	1. Buildings or facilities related to the treatment of water or sewage.
3.	Post-secondary educational institution	1. Administrative offices and related facilities. 2. Classrooms and related facilities. 3. Laboratories. 4. Student residences that have more than three storeys or a building area of more than 600 square metres. 5. Student recreational facilities and athletic facilities. 6. Libraries. 7. Parking garages.
4.	School board	1. Schools. 2. Administrative offices and related facilities. 3. Parking garages.
5.	Public hospital	1. Facilities used for hospital purposes. 2. Administrative offices and related facilities.