THE CORPORATION OF THE TOWNSHIP OF IGNACE

By-Law No. 57/2019

BEING A BY-LAW TO ADOPT AN ENERGY CONSERVATION AND DEMAND MANAGEMENT PLAN FOR THE TOWNSHIP OF IGNACE

WHEREAS the *Green Energy Act, 2009*, O.Reg. 397/11, requires that all public agencies in Ontario, including municipalities and municipal service boards responsible for the treatment or pumping of water or sewage, report annually on energy use; and

WHEREAS the *Green Energy Act, 2009*, O.Reg. 397/11, further requires that all public agencies in Ontario, including municipalities and municipal service boards, develop energy conservation and management plans, and as such, Administration has prepared an Energy Conservation and Demand Management Plan in accordance with the general best practice framework laid out by BPS Support; now therefore be it

RESOLVED THAT the Council of the Corporation of the Township of Ignace hereby enacts as follows:

1. **THAT** Appendix "A" attached hereto and forming part of this by-law be adopted as the "Energy Conservation and Demand Management Plan" for The Corporation of the Township of Ignace.

2. **THAT** this bylaw repeals and replaces all previous bylaws pertaining to Energy Conservation and Demand Management.

3. **THAT** this by-law shall come into force and effect on the final passage thereof.

Read A First And Second Time This 22nd Day of November, 2019.

Read A Third Time And Finally Passed This 22nd Day of November, 2019.

Donald Cunningham, Mayor

Marshalina Reader, CAO/Clerk

IGNACE

Explore Our Possibilities

ENERGY CONSERVATION AND DEMAND MANAGEMENT PLAN (ECDMP)

Township of Ignace

34 HIGHWAY 17 WEST
PO BOX 248
IGNACE, ON
P0T 1T0

CONTENTS

CONTENTS (continued)

1. Commitment

DECLARATION OF COMMITMENT

The Council of the Corporation of the Township of Ignace is committed to allocating necessary resources to develop and implement a five-year Energy Conservation and Demand Management Plan as required under Ontario Regulation 507/18 (Broader Public Sector: Energy Reporting and Conservation and Demand Management Plans).

The Energy Conservation and Demand Management Plan will strive to reduce our energy consumption and its related environmental impact as outlined in our overall target. Council and Staff will monitor continuous progress towards the objectives set in this plan and will update as required under Ontario Regulation 507/18 or any subsequent legislation.

VISION

The Township of Ignace will strive to continually reduce its total energy consumption and associated greenhouse gases through the integration of energy efficient infrastructures and facilities, operational efficiencies, and building the foundation for a culture of energy awareness and knowledge within the municipality.

POLICY

The Township of Ignace will incorporate energy efficiency into all areas of our activity including our organizational and human resources management procedures, procurement practices, financial management and investment decisions, and facility operations and maintenance.

As a major component of the operating cost of municipal facilities and equipment, energy cost will be factored into the lifecycle cost analysis and asset management analyses and policies of the municipality. All departments have clear links to some or all of the goals and objectives of the Energy Conservation and Demand Management Plan.

GOALS

The Energy Conservation and Demand Management Plan for the Township of Ignace will help achieve the following goals:

i. Maximize fiscal resources and avoid cost increases through direct and indirect energy savings.

ii. Reduce the environmental impact of the municipality's operations.

iii. Increase the comfort and safety of staff and patrons of the municipal facilities.

iv. To promote a culture of energy conservation within the municipality.

OVERALL TARGET

The ECDMP establishes the following quantitative targets to guide the Township's efforts as it relates to energy management from July 2019 to July 2024:

- Reducing our overall energy consumption by 10%;
- Reducing water consumption in our buildings by 10%; and
- Integrating the energy conservation plan with the capital plan, tangible capital asset policy and resiliency plan.

OBJECTIVES

To achieve the success of the strategic direction of the ECMDP, the following objectives are considered:

i. Ensure energy efficiency consistently across municipal facilities.

ii. Monitor and report on energy consumption in quarterly intervals. Staff will monitor and verify simple payback (years) to enable reinvestment in energy projects and report on energy consumption semi-annually.

iii. Better analyze energy costs and look for savings opportunities. This will include looking at energy commodity procurement options and taking advantage of all available resources and funding for energy projects.

iv. Raise Council and Staff awareness around energy efficiency. This will include communicating successes to both internal and external stakeholders.

v. Strengthen partnerships with external stakeholders such as utility providers (electricity and natural gas).

vi. Identify and seize renewable energy generation opportunities.

2. Organizational Understanding

SUMMARY OF CURRENT ENERGY CONSUMPTION, COST AND GHGS

The current energy usage by building is detailed in Appendix A.

OUR MUNICIPAL ENERGY NEEDS

The Township will need reliable, low cost, sustainable energy solutions.

STAKEHOLDER NEEDS

Internal Stakeholders (Council, CAO, Staff)

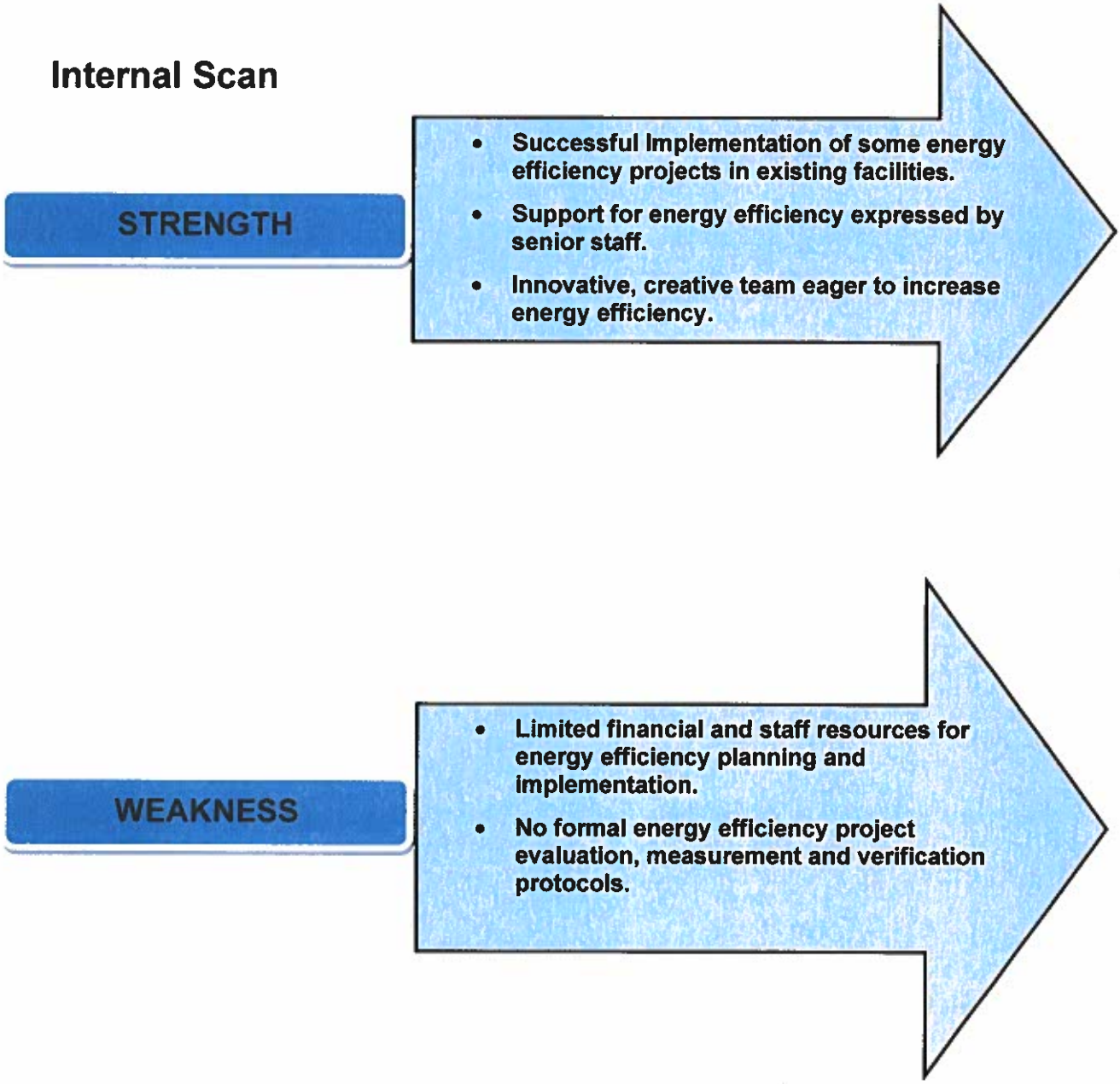
i. A clear and relevant energy management plan with clear vision, goals, and targets in order to clearly communicate the corporate commitment to energy efficiency.

ii. Timely reporting (semi-annual) of information to maintain awareness of energy use.

iii. Training and support to develop the skills and knowledge required to implement energy management practices and measures.

MUNICIPAL ENERGY SITUATION

SWOT Analysis for the current energy management of the Township of Ignace is presented in figure 1 below.



External Scan

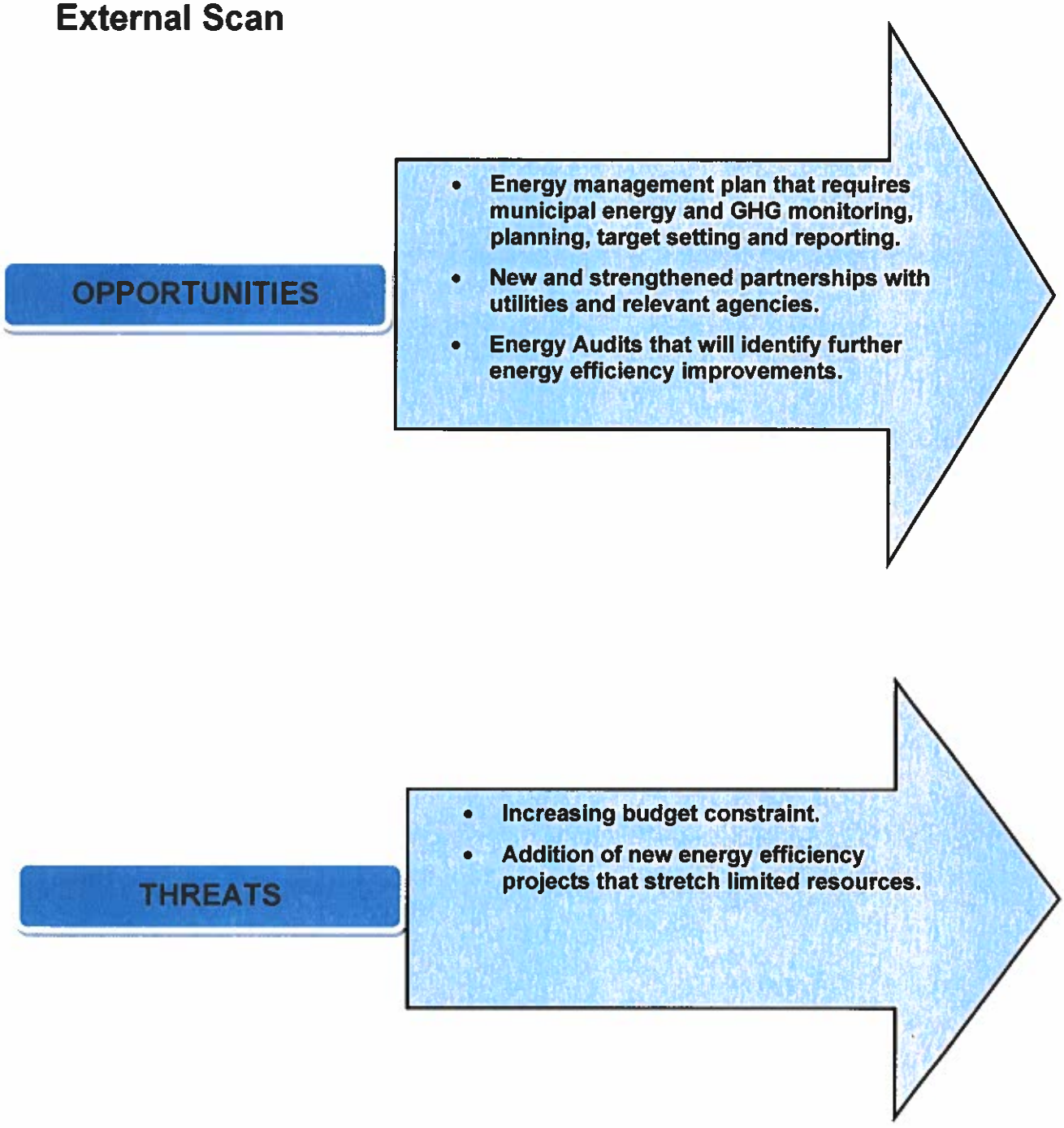


Figure 1. Township of Ignace, Energy Management SWOT

RENEWABLE ENERGY UTILIZED

The Township of Ignace aspires to show leadership in the promotion and development of renewable energy systems that are compatible with our asset management and land use planning objectives. As a result:

1. We encourage a de-lamping campaign by asking employees to identify opportunities to reduce lighting.
2. We will install occupancy sensors in all rooms.
3. Ensure computer monitor power software is enabled.
4. Train staff on proper HVAC systems and set controls.

ENERGY LEADER

The Operations Supervisor has been designated as our energy leader with overall responsibility for corporate energy management.

3. Projects Execution

MUNICIPAL LEVEL

The administration and implementation of this Energy Conservation and Demand Management Plan will be the responsibility of the Operations Supervisor. Since we all use energy in our daily activities, it will also be responsibility of all municipal staff to be aware of their energy use and work towards a culture of conservation.

Through staff training and energy management tools, staff will be able to see the results of their efforts, and benchmark between corporate facilities with industry standards. Further details are provided in the Appendix C: Proposed Program and Process Measures.

ASSET LEVEL

To sustain a corporate culture of conservation, staff must be engaged in an effective awareness and education program. Although facilities staff has the lead responsibilities, all staff should be familiar with and utilize energy efficient measures where possible. The first step is the completion of an energy audit.

4. Review

ENERGY PLAN REVIEW

The Township of Ignace will develop an annual progress report with energy consumption data and initiatives undertaken with the calendar year and will report to Council annually.

As part of the Energy Plan, the implemented processes improvement, program implementation and projects will continue to be documented and reviewed annually to update consumption savings. By regularly monitoring and reporting consumption and dollar savings and/or avoidance to Departments, the outcomes of their participation in energy management initiatives can be demonstrated and feedback can be obtained for new ideas.

This monitoring and reporting will also align with the requirements of Ontario Regulation 507/18 (Broader Public Sector: Energy Reporting and Conservation and Demand Management Plans) and/or any subsequent legislation related to energy management.

5. Evaluation Progress

ENERGY CONSERVATION MEASURES

We recognize that other measures could take place to ensure improved savings and that new conservation measures must be identified and acted upon. Our key changes to ensure the success of this conservation plan include establishing a Green Team and ensuring staff are trained on energy conservation and building operations.

The ECDMP will be reviewed by our Green Team on an annual basis to review the results of the proposed measures and determine if adjustments to the plan are required. Initiatives may be added to the plan as new opportunities arise. Updates to the plan will be posted on the Township's website.

CURRENT AND PROPOSED ENERGY CONSERVATION MEASURES INCLUDE:

The Township has achieved significant progress with the replacement of high-pressure sodium street lights to LED street lights. In addition, we have replaced the lighting in our Arena with LED products. Street lights alone can account for approximately 15% of a municipality's electricity use. LEDs consume up to 70% less electricity and reduce maintenance by up to 80% versus traditional street lighting.

Further conservation efforts at the Arena were also achieved in 2019, as it was decided that ice installation would occur once per year.

SELECTING PROPOSED MEASURES:

Energy conservation projects can be categorized as technical (switching street lighting from high pressure sodium to LED), organizational (establishing a Green Team), or behavioral (running a daylight harvesting campaign, where lights are turned off on sunny days).

Potential energy conservation projects will be identified by comparing building-level energy benchmarks to the median energy benchmark for that building type. Energy benchmarks reflect the total energy used in a building in equivalent kilowatt hours to its indoor floor area.

Benchmarks can also account for annual changes in weather by dividing the energy benchmark by the number of Heating Degree Days, which reflect the heating demands for that building. For example, if a building's energy benchmark was 7 eWh/sqft/HDD and the median benchmark for similar buildings was 4.5 eWh/sqft/HDD, that building may be a good candidate for energy conservation measures.

Energy conservation projects will be evaluated using an internal rate of return (the rate of interest the project could generate), along with simple payback (the number of years it would take to pay off the project from the savings). In addition, more costly conservation projects will be bundled with more cost-effective ones to lever their development.

Implementation of the proposed projects is dependent upon:

- Funding allocated by Council;
- Internal revolving fund (representing 50% of the savings from previous conservation projects);
- Incentives from the Independent Electricity System Operator and/or natural gas utilities;
- Availability of qualified staff; and
- Retaining a qualified contractor to implement the initiative.

Progress on projects will be monitored using the annual energy reports prepared under the regulation.

Technical Measures:

- Recommission heating, ventilation and air conditioning (HVAC) and building automation systems (BAS) in the Municipal Office, Recreation Centre and Library. BAS controls the lighting (scheduling off and on) and heating ventilation systems (temperature and areas in a building to be heated/cooled). Recommissioning looks at building systems and takes the necessary measures to ensure they are working properly. Natural Resources Canada notes recommissioning can save between 10% and 15% of a building's energy use.
    - Cost is estimated at $100,000
    - Simple payback is estimated at $40,000 per year
    - Recommissioning will take place when energy use in buildings is 10% higher than previous years

- Over the next 5 years, all restroom fixtures will be replaced with WaterSense certified low-flow products.
    - Cost is estimated at $75,000
    - Simple payback is estimated at 4 years
    - Ongoing maintenance will be required

- Evaluate the municipality's fleet (cars and light duty trucks) to determine which vehicles are suitable for replacement with electric vehicles (EV). Implement replacement initiative based on vehicles that provide the best return first.
    - Cost is estimated at $40,000
    - Simple payback is estimated at 6 years, with an internal rate of return at 8%
    - Ongoing review is required as new products such as EVs and trucks are/become available

Organizational Measures:

- Incorporate life cycle costing when purchasing is related to building systems, such as lighting, office equipment and paper. Life cycle analysis will include and consider the overall cost of purchasing, operating and disposing a product.
    - Cost is estimated at $177 for an online course offered through the Local Authority Services
    - Simple payback is estimated at 1 year
    - Ongoing application will be required

- Implement a temperature set point policy for all buildings. The US Department of Energy notes that setpoint policies can save 5 to 12% energy consumption.
    - Cost is estimated at $5,000 to address equipment issues
    - Simple payback is estimated at 1 year
    - Seasonal reviews/checks will occur
    - This measure will be revisited annually

- Initiate monthly water consumption monitoring. New and existing fixtures will be monitored for leaks and repaired as required.
    - Cost is negligible (this will be added as an accounts payable function)
    - Simple payback of 7 years
    - Ongoing application will be required

- Adopt a Train-the-Trainer policy, where staff complete courses such as Dollars to $ense Energy Management Workshops, Certified Energy Managers and Certified Building Operators programs.
    - Cost is estimated at $5,000
    - Simple payback is estimated at 5 years
    - Ongoing participation will be required

- Establish a Green Team with representation from core function areas, such as finance and building operations. The Green Team will meet monthly, review all new and existing energy conservation initiatives, and develop business cases for senior management approval.
    - Cost is estimated at $1,000 year
    - Simple payback is estimated at less than a year
    - Ongoing participation will be required

- Work with other BPS organizations in the region to develop relationships that foster energy conservation.
    - Cost will be limited to hosting meetings and possibly travel expenses
    - Ongoing participation will be required

Behavioural Measures:

- Review building automation systems every month to ensure temperature and lighting settings and schedules are where they are supposed to be.
    - Cost is thought to be minimal (part of routine checks)
    - Simple payback will be immediate
    - Ongoing review will be required

- Provide staff and public with quarterly energy reports on conservation efforts/projects including staffed-based ones such daylight management.
    - Cost will be minimal
    - Ongoing participation will be required

- Encourage staff to lower shades in the summer to keep heat out and raise them in the winter to let heat in.
    - No cost associated with this practice
    - Simple payback is immediate
    - Ongoing participation in this practice will be required

- Celebrate successful projects and initiatives with an annual lunch.
    - Cost is estimated at $500
    - Annual event

A detailed list of proposed projects, their costs and savings will be provided in the July 2020 report and update to this ECDMP. The Energy Consumption and Greenhouse Gas Emissions reports for the years 2016 and 2017 (Appendix A and B respectively), will demonstrate that the Township has indeed achieved some positive results in terms of energy conservation.

RENEWABLE ENERGY PROJECTS

Ground source heat pumps will be reviewed for installation at the Ignace Public Library and Municipal Office to reduce reliance on fossil fuel for heating and demand for electricity for air conditioning. Heat pumps cost approximately $80,000 to install and saves approximately $10,000 per year vs. conventional heating and cooling. The heat pump harnesses heat from the ground to heat the facility in the winter, and moves hot air into the ground to cool the building in the summer.

ENERGY CONSUMPTION

The ECDMP should be reviewed annually. As part of the annual review, the Municipal Energy Leader assigned to oversee the implementation of the ECDMP should complete or assign someone to complete the following steps:

i. Track the activities that have been implemented, based on a check list of all the actions included in the ECDMP;

ii. Note any updates to the ECDMP, based on new audits, organizational or resource changes;

iii. Identify the priority actions for the upcoming year, and secure funding and resources for their implementation;

iv. In July 2020, submit the Energy Consumption and Greenhouse Gas Emissions Report as required under Regulation 507/18 and report on implementation of the ECDMP and update the ECDMP. Include detail regarding: energy and GHG emissions for the years 2018 to 2019; current and proposed energy conservation and demand management measures; a report of results achieved; and a revised forecast of the expected results of the current and proposed measures.

APPENDIX A: 2016 ENERGY CONSUMPTION AND GREENHOUSE GAS EMISSIONS DATA

FACILITY NAME	TOTAL AREA (m^2)	ELECTRICITY QUANTITY	NATURAL GAS QUANTITY	GHG EMISSIONS (kg)	ENERGY INTENSITY (ekWh/sqft)	ENERGY INTENSITY (ekWh/Mega litre)
Airport	1,680.00	41,824.00000	0.00000	1,486.75955	24.89524	0.00000
Entrance Lights	1.00	2,548.00000	0.00000	90.57630	236.71684	0.00000
Fire Hall	1,055.00	31,824.41000	5,223.22000	11,006.45489	82.78259	0.00000
Golf Course	2,500.00	27,760.00000	0.00000	986.81248	11.10400	0.00000
Public Works Garage	4,556.00	40,096.92000	7,757.83000	16,092.52817	26.89759	0.00000
Raw Water Pumping Station	900.00	129,570.00000	0.00000	4,605.95436	143.96667	0.00000
Recreation Centre	41,679.00	479,454.92000	31,761.18000	77,092.20796	19.60233	0.00000
Sewage Lift	1.00	140.8300	0.00000	5.00622	13.08353	0.00000
Sewage Treatment Facility	0.00	247,101.00000	4,962.05700	18,165.34529	0.00000	0.78833
Sewer Pumping Station	196.00	7,354.69000	885.76900	1,936.10331	85.55329	0.00000
Street Lights	1.00	122,835.00000	0.00000	4,366.53858	11,411.74001	0.00000
Toboggan Hill	1.00	1,689.97000	0.00000	60.07505	157.00328	0.00000
Town Hall	2,719.00	83,773.82000	8,068.28000	18,232.09976	62.34708	0.00000
Waste Disposal Site	144.00	7,086.00000	0.00000	251.89313	49.20833	0.00000
Water Treatment Facility	0.00	227,700.00000	9,467.39200	25,993.58653	0.00000	0.49784
Well #3	234.00	1,594.80000	1,392.32900	2,689.06675	70.05197	0.00000

APPENDIX B: 2017 ENERGY CONSUMPTION AND GREENHOUSE GAS EMISSIONS DATA

FACILITY NAME	TOTAL AREA (m^2)	ELECTRICITY QUANTITY	NATURAL GAS QUANTITY	GHG EMISSIONS (kg)	ENERGY INTENSITY (ekWh/sqft)	ENERGY INTENSITY (ekWh/Mega litre)
Airport	1,680.00	32,640.00000	0.00000	564.60672	19.42857	0.00000
Entrance Lights	1.00	2,322.00000	0.00000	40.16596	215.72077	0.00000
Fire Hall	1,055.00	23,226.27000	6,041.67000	11,824.31245	82.87753	0.00000
Golf Course	2,500.00	21,229.00000	0.00000	367.21924	8.49160	0.00000
Lift Station	1.00	7,225.15000	0.00000	124.98064	671.23811	0.00000
Public Works Garage	4,556.00	32,762.61000	13,241.73000	25,601.89989	38.08006	0.00000
Raw Water Pumping Station	900.00	69,323.00000	0.00000	1,199.14925	77.02556	0.00000
Recreation Centre	41,679.00	535,571.72000	46,495.34000	97,169.66479	24.70582	0.00000
Sewage Lift	1.00	137.08000	0.00000	2.37121	12.73514	0.00000
Sewage Treatment Facility	0.00	220,337.00000	5,034.89900	13,330.50542	0.00000	0.87615
Sewer Pumping Station	196.00	0.00000	852.74800	1,612.22839	46.23886	0.00000
Street Lights	1.00	114,334.00000	0.00000	1,977.74953	10,621.97160	0.00000
Toboggan Hill	1.00	939.85000	0.00000	16.25753	87.31488	0.00000
Town Hall	2,719.00	64,813.68000	12,423.73000	24,609.78642	72.39806	0.00000
Waste Disposal Site	144.00	2,592.00000	0.00000	44.83642	18.00000	0.00000
Water Treatment Facility	0.00	184,058.00000	10,625.77200	23,273.20672	0.00000	0.54907
Well #3	234.00	2,977.21920	1,221.82000	2,361.50582	68.21560	0.00000

APPENDIX C: PROPOSED PROGRAM AND PROCESS MEASURES

Program Description	Facility	Key Contact	Date	Objectives
Senior Management	Municipal Office	Operations Supervisor	Q3 & Q4 2019-2023	To develop a process for the collection and tracking of energy invoices. Quarterly reviews will occur to monitor and verify monthly data. Energy reports to be reviewed semi-annually.
New Employee Orientation	All	Human Resources	As needed	As part of Orientation Program: provide new staff with energy management training. Training shall be provided every two years.
Energy Leader	All	Operations Supervisor	Q4 2019	The Operations Supervisor has been designated as the Energy Champion and will continue to: - Instill a culture of energy conservation in the workplace. - Develop conservation strategies with staff and implement the same across all departments and facilities. - Share best practices, lessons learned, and innovative energy practices with team members. - Monitor progress towards energy conservation goals and ensure that there is no regression.
Employee Engagement	All	Operations Supervisor	Q4 2019	Staff will be encouraged to submit ideas for process improvements or projects that will reduce the corporate and personal energy consumption.

APPENDIX C: PROPOSED PROGRAM AND PROCESS MEASURES (continued)

Process Description	Facility	Key Contact	Date	Objectives
Procurement	All	Operations	Q2 & Q4 2019-2023	Energy prices fluctuate constantly, which can significantly affect our energy bill and performance against budget. By taking a proactive approach to buying energy, we can better control our costs. The Municipality should examine options to procure energy commodities more efficiently than the de facto method and investigate offerings such as those managed by LAS.
Start Up and Shut Down Procedures	All	Operations Supervisor	As needed	Implement start-up and shut-down schedules to eliminate energy waste.
Review Rental Rates	Recreation Centre	Operations	Q4 2019	It may need to be recommended that that the municipality consider increasing rates to reflect rising energy costs.
Appliance Usage	All	Operations	Q4 2019	Staff will be encouraged to reduce phantom power wherever possible by turning off electrical devises such as coffee makers, microwaves, telephone charges, computers, computer monitors on weekends.