MUNICIPALITY OF ST.-CHARLES

CONSERVATION AND DEMAND MANAGEMENT PLAN

December 2024

This plan is designed to demonstrate Municipal compliance with Ontario Regulation 25/23 which is under the *Electricity Act, 1998*

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Contents

Executive Summary

The Municipality of St.-Charles boasts the natural beauty of the West Arm of Lake Nipissing and Lake Nepewassi. Year after year, a significant number of tourists come for the great fishing, hunting and ecological attractions found throughout this quaint rural municipality.

The first settlers to arrive in St.-Charles were from Quebec and Eastern Ontario. These settlers were attracted by promises of readily available large parcels of good farmland. Today, agriculture has become a secondary activity for many farmers. The Municipality of St.-Charles is located fifty-nine (59) kilometers east of Sudbury in Northern Ontario and was created in 1999 by amalgamating the Townships of Casimir, Jennings, and Appleby. The Municipality is surrounded by several small lakes and borders on the West Arm of Lake Nipissing.

The region was settled in 1890 by newcomers from Quebec and Eastern Ontario. The settlers' history and traditions are still reflected in the community today with a notable portion of the community being fluent in both French and English. St.-Charles remains a small farming community, although agriculture is no longer the largest economic sector. The close proximity to Sudbury, North Bay, and Sturgeon Falls allows residents to commute to larger cities for work. Demand in the region is notably driven by moderate population growth, a budding summer cottage community, and an aging population above the provincial average. Population growth is largely due to urban sprawl and low housing prices.

St.-Charles is home to a population of 1,357 with a land area of 321.75 square kilometers but sees a significant increase in population during the warmer months. Many seasonal residents and visitors settle in our trailer parks, lodges, and cottages along the shores of Lake Nepewassi and of course, the ever-popular West Arm of Lake Nipissing.

The Municipality has a five (5) member Council that typically meets on the first and third Wednesday of each month. The CAO oversees a staff of approximately eleven (11) people. The Municipality has appointed boards and committees along with various volunteers who work on behalf of the Municipality at various functions.

There are currently a number of formative plans in place that set the overall direction of the Municipality. The Official Plan, Strategic Plan, and Zoning By-Law provide guidance for future growth and development with regard to relevant social, economic, and environmental matters. The Accessibility Plan provides direction for the provision of services and planning to better accommodate those with disabilities. The Municipality of St.-Charles has created and maintains the St.-Charles Asset Management Plan for

managing and maintaining a broad portfolio of infrastructure assets to deliver services to the community.

In an era of heightened environmental awareness and escalating energy costs, it is imperative for organizations to adopt robust energy conservation and demand management strategies. Through a combination of technological advancements, behavioral changes, and operational improvements, we aim to minimize our environmental footprint while maximizing cost savings.

Ontario Regulation 25/23 (broader Public Sector: Energy Reporting and Conservation and Demand Management ("CDM") Plans) requires broader public sector organizations such as Municipalities to develop a CDM plan and update it every five (5) years. The CDM plan shall be approved by 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 agencies head office.

The plan shall include:

- A summary of annual greenhouse emissions for each of the agency's prescribed operations, which shall include the agency annual energy consumption.
- 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.
- 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.
- 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.
- A description of,
    - the ground source energy utilized, if any, by ground source heat pump technology operated by the public agency,
    - the solar energy utilized, if any, by thermal air technology or thermal water technology operated by the public agency, and
    - the proposed plan, if any, to operate heat pump technology, thermal air technology or thermal water technology in the future.
- 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.
- A confirmation that the Energy Conservation and Demand Management Plan has been approved by the public agency's senior management.

- 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.

Approach to Energy Conservation

Commitment

Declaration of Commitment

The Municipality of St.-Charles strives to reduce our total energy consumption and associated GHG production through efficient use of energy consumption where available while maintaining an effective level of service for the community. Energy conservation requires a collaborative effort from both employees and residents of the Municipality of St.-Charles to reduce our consumption of valuable energy resources. Energy conservation will require a collaborative effort to increase education, awareness and understanding of energy management within the Municipality. By building a culture of energy awareness throughout the community, our future energy consumption and environmental impacts can be drastically reduced, and the avoidance of unnecessary cost increases can be averted.

Vision

The Municipality of St.-Charles already has a number of formative plans that set the overall direction for the Municipality, and environmental leadership. This Conservation and Demand Management Plan is guided by visions and goals contained in the Municipality's Strategic Plan and Official Plan.

Policy

We 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 lastly facility operations and maintenance.

Goals

- Create a culture of energy conservation within the facilities and community.

- Educate and engage employees to foster a culture of energy conservation and sustainability. Improving energy efficiency in our facilities to reduce our operating costs, energy consumption and greenhouse gas emissions (GHG)

- Take advantage of all available resources and funding for energy conservation projects.

- Continue using the LAS Power Purchase Agreement to reduce our monthly energy bills.

- Monitor and report on energy consumption for the municipal facilities.

- Embed energy management into the Municipality's decision-making processes including asset management plans, budgeting, and project designs.

- Monitor and analyze the energy consumption of facilities at least annually to ensure we are reducing energy consumption and GHG emissions.

- Apply for grants and funding to help raise our energy efficiency and lower our consumption in all the facilities.

- Seek out savings and opportunities through energy procurement options and taking advantage of all resources and funding available for energy projects.

- Purchase smart energy monitors to add to our facilities biggest energy consumers to monitor energy consumption and alert as to when there are areas of excessive consumption, which would be a result of an issue with that appliance or piece of equipment.

- The planting of trees in the community will also help to reduce the Municipality's carbon footprint.

- Implement a regular maintenance schedule on all components to ensure equipment operates at peak efficiency.

- Source energy-efficient equipment and appliances for all operational needs.

Overall Target

We will reduce our consumption of fuels and electricity in all municipal operations by an average of 2% per year between now and 2030.

Objectives

1. To implement energy audits on all municipal facilities during the next five (5) years.

2. To reduce total energy consumption in municipal facilities, normalized to weather conditions, by 2% over the next five (5) years.

3. To reduce energy consumption in the municipal recreation complex by 2% during fiscal year 2025/2026.

Organizational Understanding

Our Municipal Energy Needs

The Municipality of St.-Charles requires reliable, low cost, sustainable energy resources delivering energy to the most efficient facilities and energy consuming technologies feasible. In order to stay within the Municipal budget, we have no choice but to curb our energy usage.

Stakeholder Needs

Internal stakeholders (Council, Committees, CAO, staff) need to be able to clearly communicate the corporate commitment to energy efficiency, and to develop the skills and knowledge required to implement energy management practices and measures. External stakeholders (the province, community citizens and groups) need the municipality to be accountable for energy performance and to minimize the energy component of the costs of municipal services.

Municipal Energy Situation

An assessment of the organizational structure and current practices suggest that energy use and costs will continue to rise and are forecasted to increase further. Data relating to energy consumption and costs need to be more prominent to municipal decision makers such as council and senior management. This is imperative to identify opportunities for efficiency. Increased efforts must be made to raise general staff awareness about energy efficiency.

How We Manage Energy Today

Cost management is the responsibility of the management team by way of budgeting. Data is received by the supplier invoices and reviewed prior to authorization for payment.

Summary of Current Energy Consumption, Cost and GHGs

The total annual energy consumption in municipal operations for 2023 was 1,097,163 kWh, at a cost of $193,473.28 per year, and GHG emission of 94,379 tonnes per year.

Renewable Energy Utilized or Planned

The Municipality of St.-Charles 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.

Structure Planning

Staffing requirements and duties

We will incorporate energy efficiency into standard operating procedures and the knowledge requirements for operational jobs.

Consideration of energy efficiency for all projects

We will incorporate energy efficiency and life cycle cost analysis into standard operating procedures and the knowledge requirements for all jobs.

Resources Planning

Energy Leader

The Municipality of St.-Charles will identify staff members and personnel who will be responsible for energy performance or who can make essential input to the energy management process.

Energy Training

We will develop and deliver energy training for relevant staff. This training will not be limited to operators and maintainers with "hands-on" involvement with energy-consuming equipment but will also include others since they also make energy consumption decisions in their daily work. Training focused on the energy use and conservation opportunities associated with employee's job functions will be utilized whenever possible.

Projects Execution

Municipal Level

We will carry out the required development of business procedures and communication programs and implement them methodically according to the planned timelines within the resources constraints that apply.

Asset Level

In order to sustain a culture of conservation, staff must be engaged in an effective awareness and education program. Although facilities staff have the lead responsibility for ensuring facilities operate efficiently, all staff should be familiar with and utilize energy efficient measures where possible. The first step in implementing an energy management program is the completion of energy audits for facilities. Audits involve a technical review of a facility and its operations, the development and analysis of a baseline energy profile for the facility and identification of energy conservation opportunities and savings. Another important component of an energy management program is the re-commissioning of Municipal facilities. Over the life cycle of a facility, the mechanical building automation and distribution systems are adjusted from day-to-day to suit user room temperature requirements. Moreover, mechanical distribution or building controls instrumentation is sometimes overlooked when renovations take place. Re-commissioning involves examining the original mechanical design and operating specification against any building renovations and recalibrate the settings to suit today's energy efficient standard practices. It also ensures that mechanical operating practices are current and appropriate to maximize building system efficiencies.

Review

Energy Plan Review

The Conservation and Demand Management Plan should be reviewed at least once a year. As part of the annual review, the Manager assigned to oversee, monitor, and implement the plan should complete the following steps.

1. Track the activities that have been implemented, based on a checklist of all the actions included in the CDM Plan.

2. Track progress towards targets.

3. Note any updates to the CDM Plan based on new audits, organizational changes, or lessons from past projects.

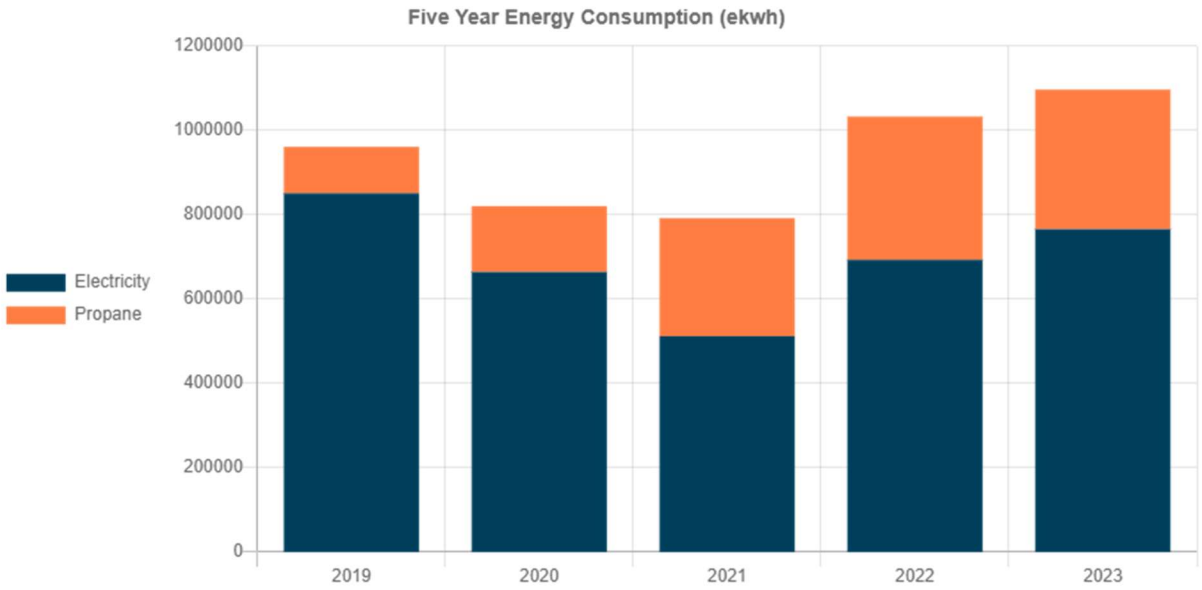
4. Identify the priority actions for the upcoming year and recommend funding and resources for their implementation.

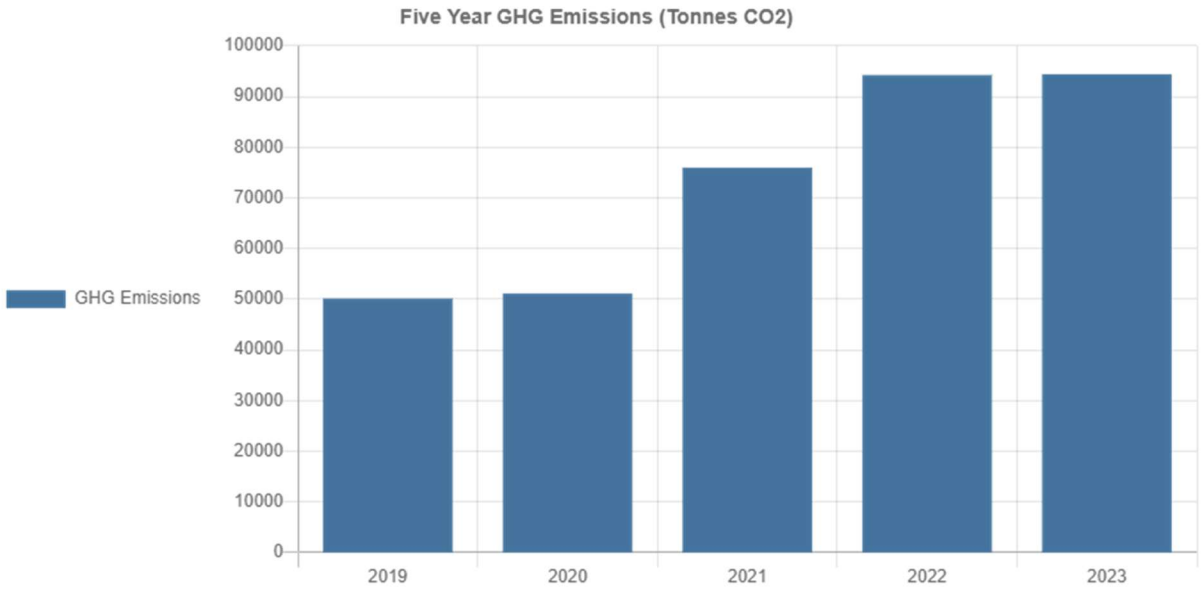
5. Determine, if possible, the cost savings achieved from the actions that have been implemented.

6. Compile a short report annually describing projects implemented, progress towards targets, cost savings achieved, updates to the CDM plan, and priority actions for the upcoming year.

Review of Previous Energy Consumption

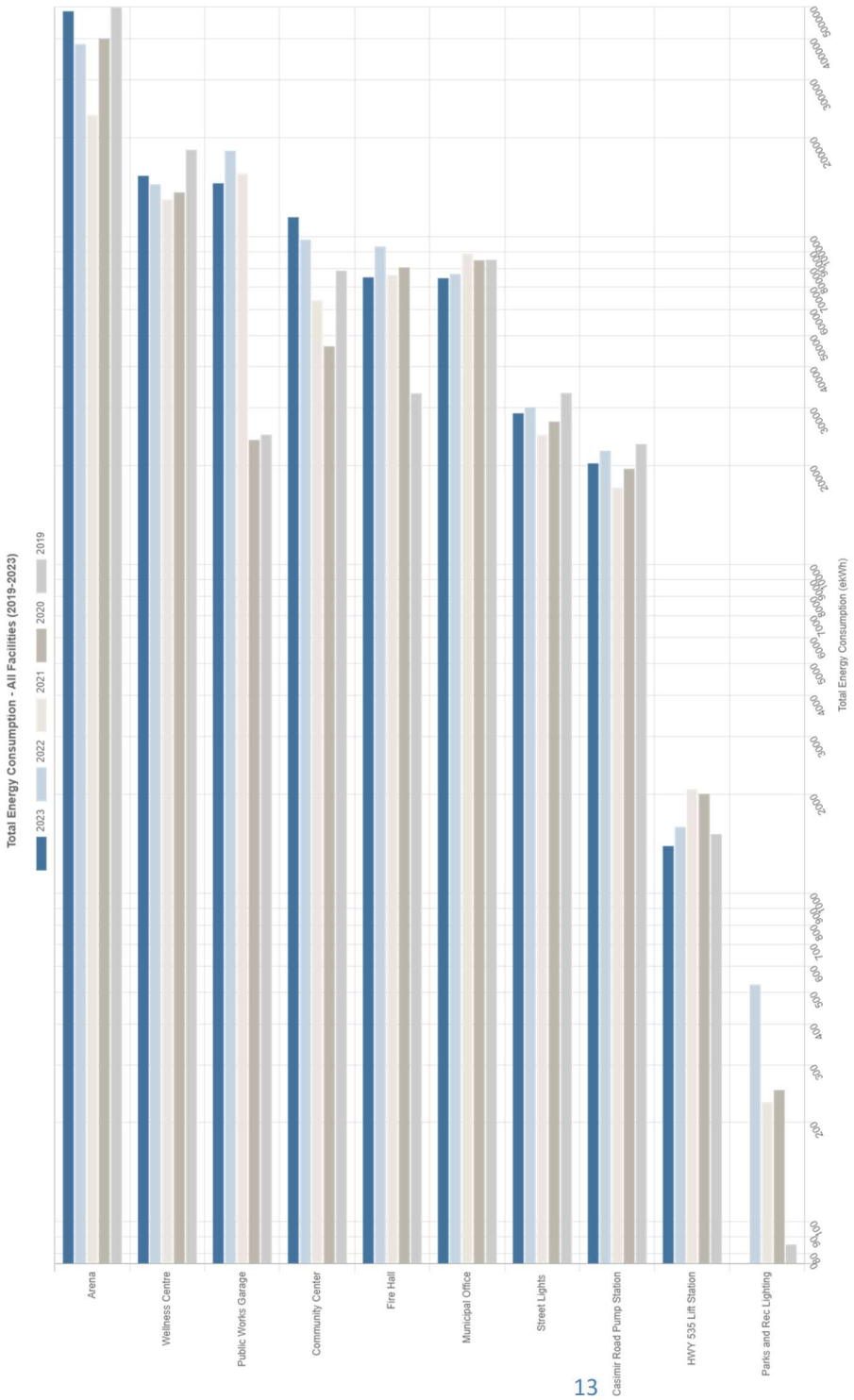
Our goal is to decrease energy consumption by 2% and GHG emissions by 2% as compared to our baseline year of 2019. In 2020 due to COVID, Municipal facilities were closed down for the better part of the year. The arena was open from January to March. The arena did not reopen in September as usual. The Municipal office was not running at full capacity, at the Wellness Center, UNIVI and the pharmacy remained open while other offices were closed. The Community Center remained closed in 2020 and reopened in 2021 for vaccine clinics.


Five Year Energy Consumption (ekwh)
1200000
1000000
800000
600000
400000
200000
0
Electricity
Propane
2019
2020
2021
2022
2023


Five Year GHG Emissions (Tonnes CO2)
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
GHG Emissions
2019
2020
2021
2022
2023

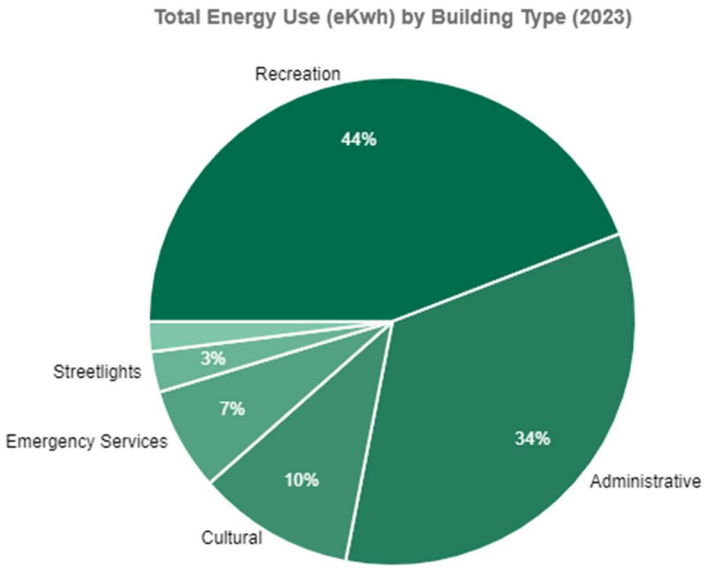
Current Energy Consumption

Energy Summary

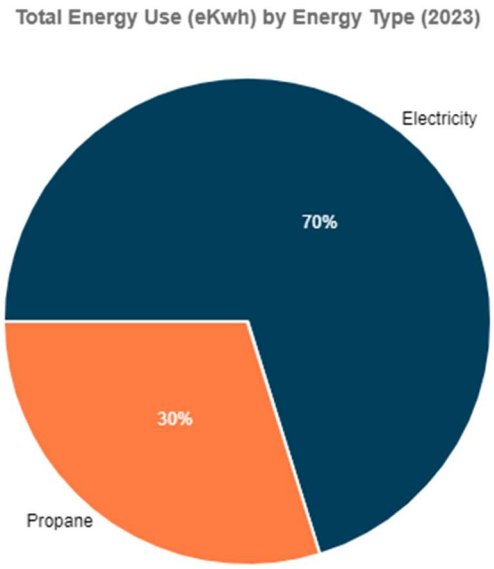

Total Energy Consumption - All Facilities (2019-2023)
2023
2022
2021
2020
2019
Total Energy Consumption (ekWh)
Arena
Wellness Centre
Public Works Garage
Community Center
Fire Hall
Municipal Office
Street Lights
Casimir Road Pump Station
HWY 535 Lift Station
Parks and Rec Lighting

Facility Name	Facility Type	Total Energy (ekwh)	Propane (ekwh)	Elect. (ekwh)	GHG (Tonnes CO2)
	Municipal Totals	**1,097,163**	**331,076**	**766,087**	**94,379**
Arena	Indoor Ice Rinks	484,332	23,067	461,265	18,190
Casimir Road Pump Station	Sewage Pumping Facilities	21,742	0	1,392	619
Community Center	Community Centre	114,291	56,012	58,279	13,936
Fire Hall	Fire Stations	75,017	58,747	16,270	13,340
Municipal Office	Administrative Offices	227,327	13,780	139,014	19,012
Parks and Rec Lighting	Street Lighting	29,443	0	28,913	838
Public Works Garage	Equipment and Vehicle Storage	145,010	127,499	17,511	28,444

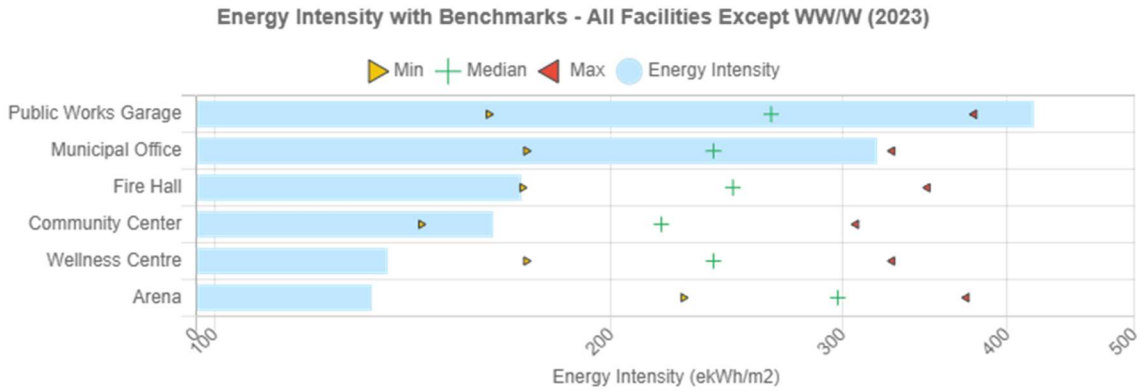
Energy Trends



Our largest user of energy was Recreation facilities, followed by Administrative, Cultural, and Emergency Services.



Our largest source of energy is Electricity, making up 69.8% of the total.



Public Works Garage is outside of the benchmarks for 2023. We added insulation to the roof in the fall of 2023 to lower our energy costs. We have also replaced the oil furnace with a propane tube heating system. The consumption of the oil furnace is not documented for 2019 to 2022 as we had no way to determine the quantity of oil that was being used. Therefore, a spike in energy consumption for the winter of 2021 onward was expected.

Arena only operates from October to March every year (6 months). The majority of energy consumption is during that timeframe.

Conservation Measures

Completed

Facility Name	Measure Description	Date Complete	Life (Y)
Municipal Office	New high performance double pane argon gas filled with low-e coating windows	2023	30
Municipal Office	Reconstruction and insulation of knee walls under windows	2023	50
Municipal Office	LED energy efficient retrofit lighting throughout building	2019	15
Municipal Office	New furnace and air conditioner	2018	15
Fire Hall	New LED energy efficient retrofit lighting throughout building in 2019	2019	15
Fire Hall	New furnace in 2018	2018	20
Wellness Centre	New wall air conditioner in the pharmacy	2023	15
Wellness Centre	LED energy efficient retrofit lighting throughout the building	2018	15
Wellness Centre	HVAC air handling units (2)	2019	20
Wellness Centre	Reconstruction of the Univi Health Centre in 2023 with energy efficient light fixtures, washrooms, exhaust, and electrical components.	2023	20

Facility Name	Measure Description	Date Complete	Life (Y)
Community Centre	New windows	2023	30
Community Centre	LED energy efficient retrofit lighting throughout the building	2018	15
Community Centre	New furnace and air conditioner	2022	15
Community Centre	Spray foam insulation on interior of roof	2023	50+
Community Centre	Replacement of exterior lighting to LED	2023	15
Arena	New condenser and tower for the ice plant.	2023	20
Arena	New LED energy efficient retrofit lighting throughout building excluding ice pad.	2014	15
Arena	Some new washroom fixtures.	2023	20
Public Works Garage	New spray foam insulation with polyurethane coating	2023	50+
Public Works Garage	New propane heaters	2023	20
Public Works Garage	New LED lighting	2019	15

In Progress

Proposed Upgrades

Facility Name	Measure Description	Proposed Year to be Complete	Life (Y)
Municipal Office	Renovation of washrooms to include energy and water efficient fixtures. Includes tankless hot water on demand.	2025	20
Municipal Office	Replace exterior doors with energy star rated doors.	2025	25
Municipal office	Negative air pressure testing and thermal imaging camera scan with an infrared detector to capture where the heat loss is occurring due to poor insulation. If areas of concern are found, repair those areas.	2026	10+
Fire Hall	Renovation of washrooms to include energy and water efficient fixtures and hot water on demand system	2024	20
Fire Hall	Insulation in ceiling and exterior walls.	2025	50+
Fire Hall	New energy efficient window and door replacements.	2025	30
Fire Hall	Negative air pressure testing and thermal imaging camera scan with an infrared detector to capture where the heat loss is occurring due to poor insulation. If areas of concern are found, repair those areas.	2026	10+

Facility Name	Measure Description	Proposed Year to be Complete	Life (Y)
Wellness Centre	Replacement of older, zoned supplementary heat and cooling units to energy efficient heat pump units.	2026	20
Wellness Centre	Tankless on demand water systems to replace the hot water tanks.	2025	20
Wellness Centre	Window replacement	2028	30
Wellness Centre	Washroom fixture upgrades to energy efficient and water conserving units	2026	20
Wellness Centre	Replacement of exterior lighting to LED	2026	15
Wellness Centre	Negative air pressure testing and thermal imaging camera scan with an infrared detector to capture where the heat loss is occurring due to poor insulation. If areas of concern are found, repair those areas.	2026	10+
Community Centre	Renovation of washrooms to include energy and water efficient fixtures	2026	20
Community Centre	Tankless hot water on demand	2026	20
Community Centre	Replace exterior doors with energy star rated doors	2027	20
Community Centre	Replace secondary wall heater units with energy star rated heat pump units.	2027	20

Facility Name	Measure Description	Proposed Year to be Complete	Life (Y)
Community Centre	Replace thermostat with tamper proof Wi-Fi / Bluetooth enabled programmable thermostat	2025	10
Community Centre	Replacement of older refrigeration units with energy star rated units	2028	15
Community Centre	Have a qualified geo-thermal technician in to diagnose the issue with the existing unit and see if it is feasible to reinstate it.	2028	*
Community Centre	Replace high pressure sodium lights to energy star rated LED units.		
Arena	Replacement of zoned supplementary heaters and air conditioners to energy efficient heat pump units with digital programmable thermostats.	2027	20
Arena	Tankless hot water on demand to replace the hot water tanks.	2025	20
Arena	Windows to energy efficient Thermopane glass.	2028	30
Arena	Washroom fixtures such as timed shower units to conserve water and energy usage. Propane heat to natural gas, and low flow toilets and faucets in the areas that have not been renovated.	2028	20
Arena	Upgrade roofing paint to reflective coated polyurethane to prolong the life of the existing roofing material.	2029	50+

Facility Name	Measure Description	Proposed Year to be Complete	Life (Y)
Arena	An energy audit was completed in 2008 by L.B. Storey professional Energy Solutions and some of the recommendations were enacted. A new energy audit would be recommended.	2029	*
Arena	Replace exterior doors and door seals to energy star rated units.	2029	20
Arena	Timers for dressing room heaters and exhaust fans.	2025	20
Arena	Negative air pressure testing and thermal imaging camera scan with an infrared detector to capture where the heat loss is occurring due to poor insulation. If areas of concern are found, repair those areas.	2026	10+
Public Works Garage	Tankless hot water on demand to replace hot water tank.	2026	20
Public Works Garage	Replace all garage doors and man doors with insulated energy star efficient doors.	2025	20
Public Works Garage	Washroom fixtures to conserve water usage.	2025	20
Public Works Garage	High velocity ceiling fans (HVLS) to push down the warm air from the ceiling.	2024	20
Public Works Garage	Insulate walls where there is insufficient insulation.	2025	20+

Facility Name	Measure Description	Proposed Year to be Complete	Life (Y)
Public Works Garage	Negative air pressure testing and thermal imaging camera scan with an infrared detector to capture where the heat loss is occurring due to poor insulation. If areas of concern are found, repair those areas.	2024	10+

Appendix A: Facility Details

Arena

99 King St East

St.-Charles ON

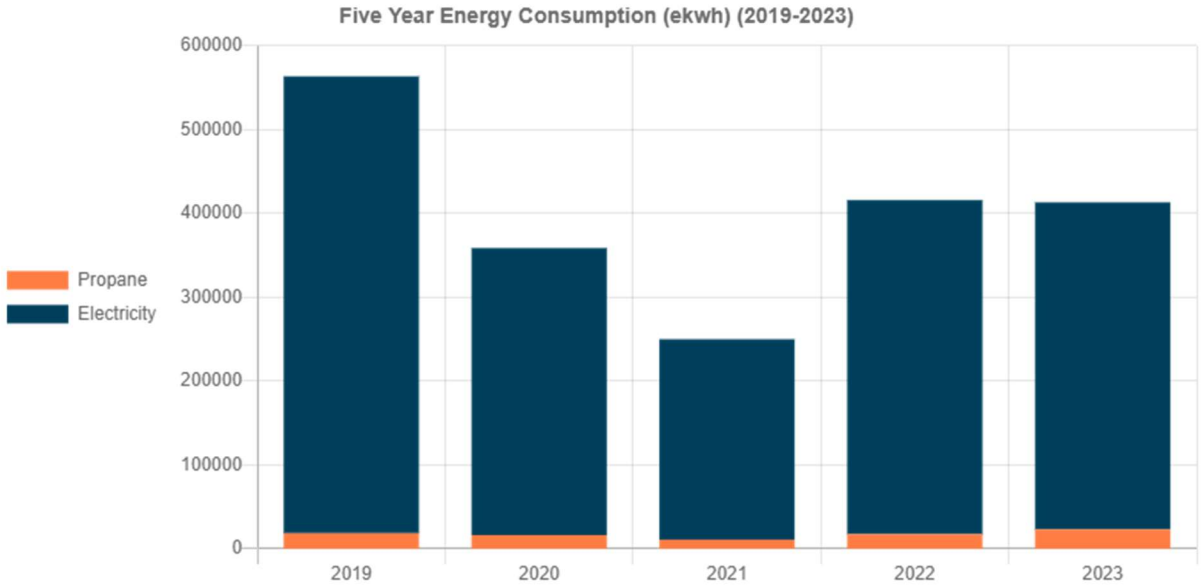
P0M 2W0

Arena with single ice pad and community hall

3683 square meter floor space including upper level.

2086 Annual Hours of Operation

Over the past 5 years this building has decreased energy consumption by 2.8%



Community Center

20 Casimir Road

St.-Charles ON

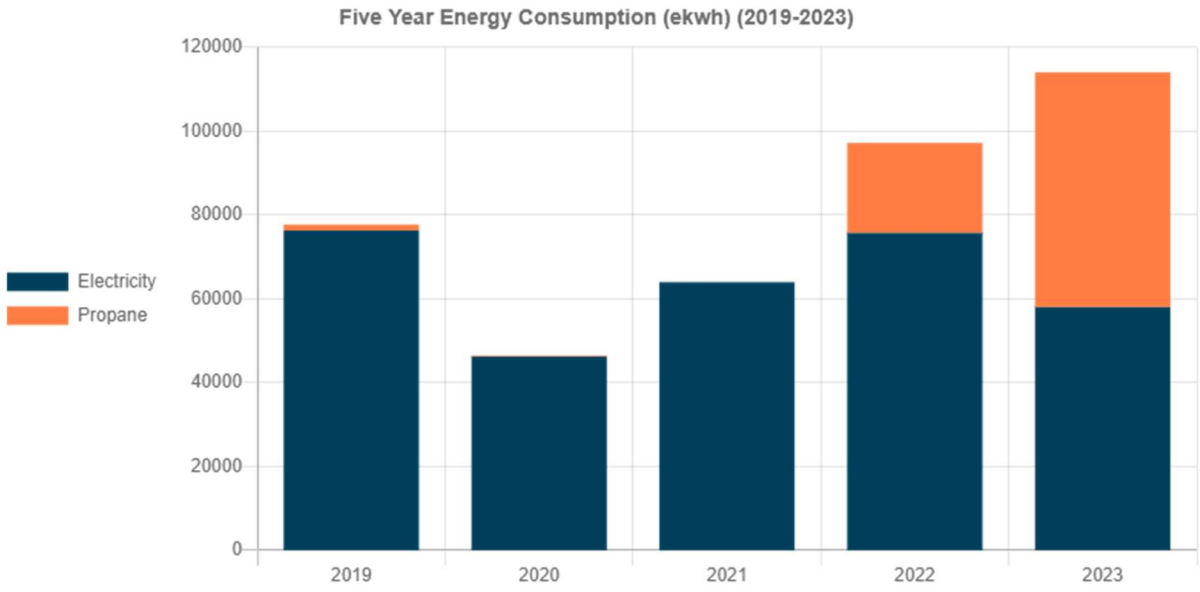
P0M 2W0

Community Hall

703 square meter floor space

521 Annual Hours of Operation

Over the past 5 years this building has increased energy consumption by 45.5%



Fire Hall

11 St. Joseph Street

St.-Charles ON

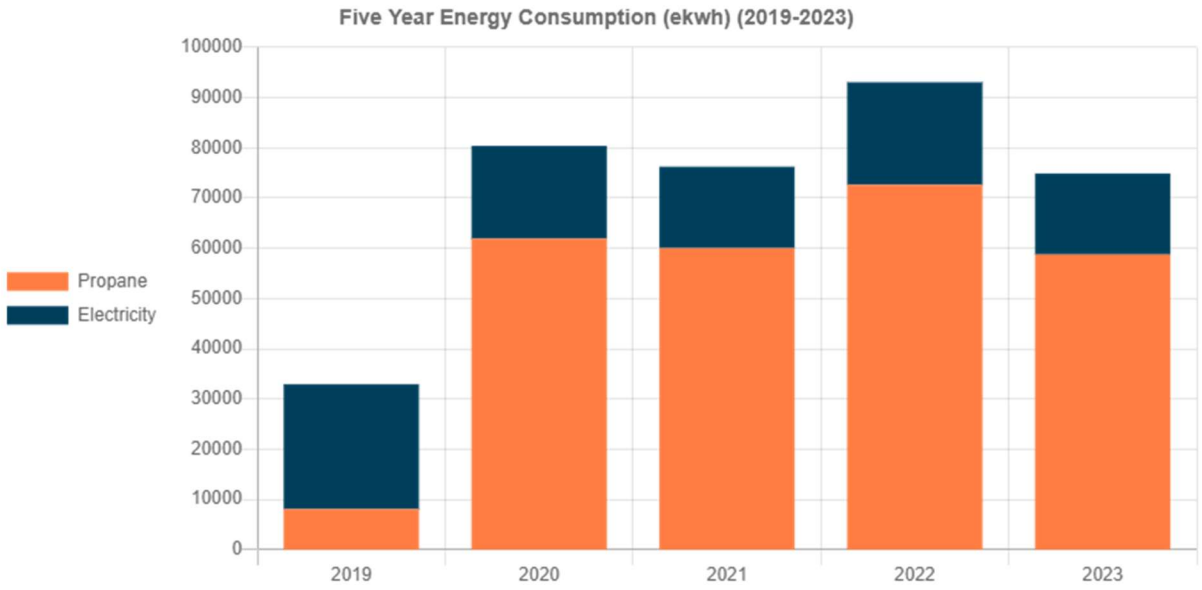
P0M 2W0

Fire Hall

439 square meter floor space on 2 levels

521 Annual Hours of Operation

Over the past 5 years this building has increased energy consumption by 125.6%



Municipal Office

2 King Street East

St.-Charles ON

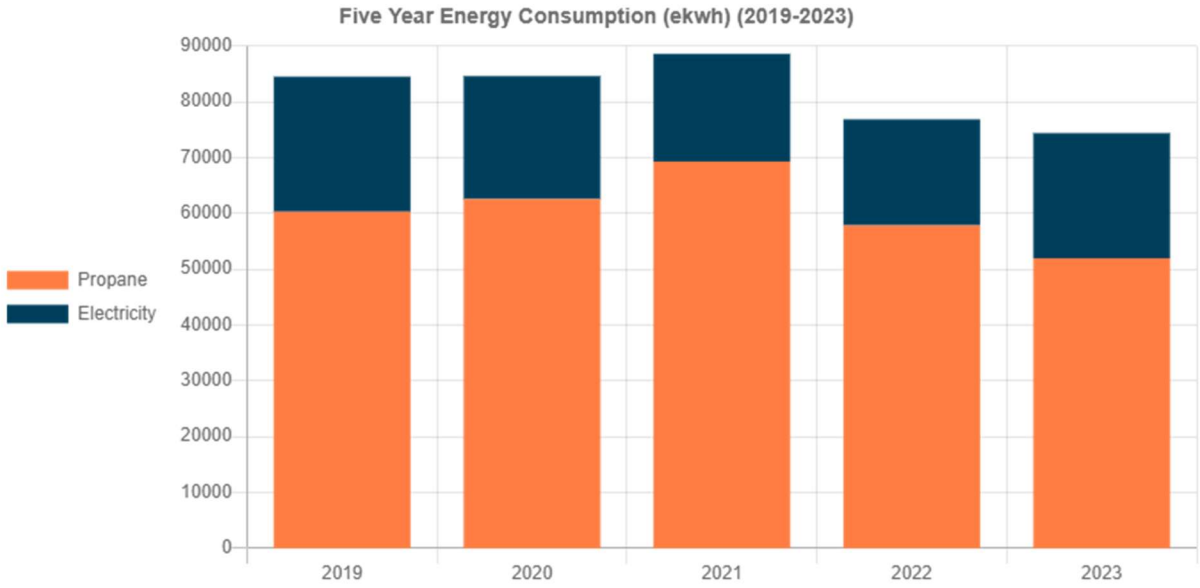
P0M 2W0

Administrative office

234 square meter floor space

2086 Annual Hours of Operation

Over the past 5 years this building has decreased energy consumption by 12.1%



Parks and Rec Lighting

P.O. Box 70

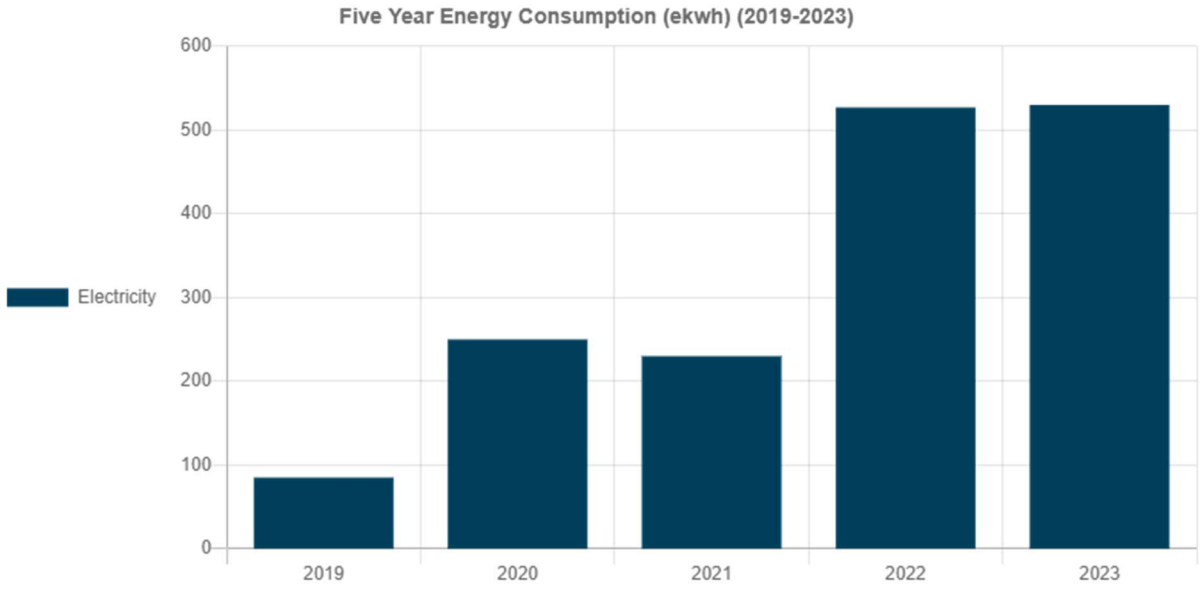
St.-Charles ON

P0M 2W0

Outdoor lighting for Parks and Recreation

521 Annual Hours of Operation

Over the past 4 years this asset has increased energy consumption by 523.5%



Public Works Garage

40 Casimir Road

St.-Charles ON

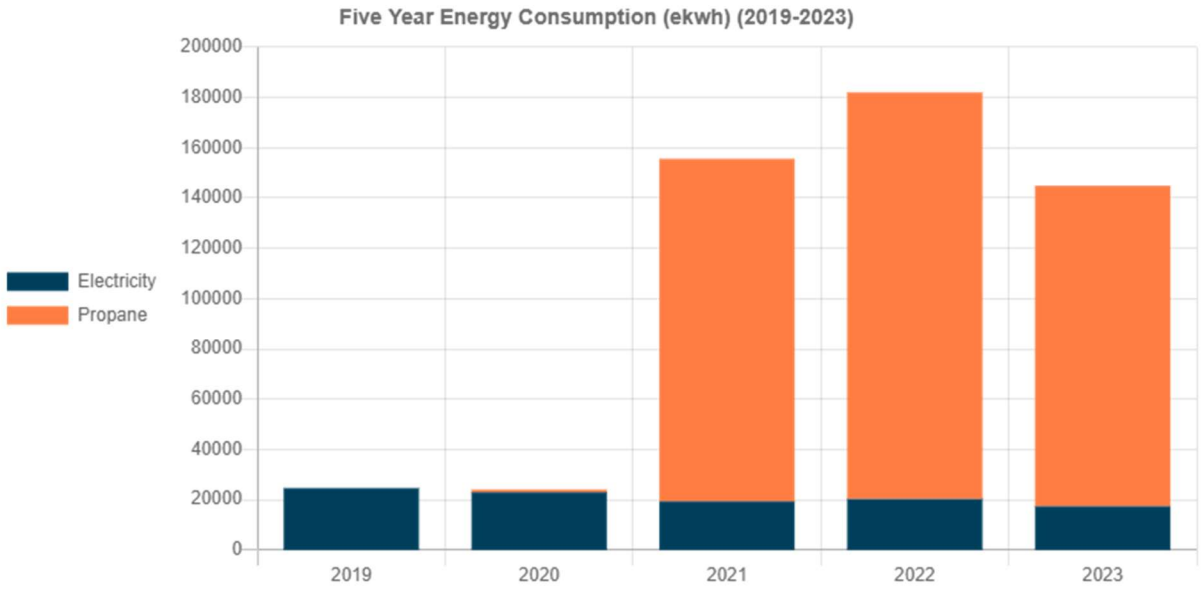
P0M 2W0

Public Works Garage

346 square meter floor space

2086 Annual Hours of Operation

Over the past 5 years this building has increased energy consumption by 482.5% with the addition of propane consumption as oil consumption was not monitored.



Streetlights

Municipality Of St.-Charles, ON, Canada

St.-Charles ON

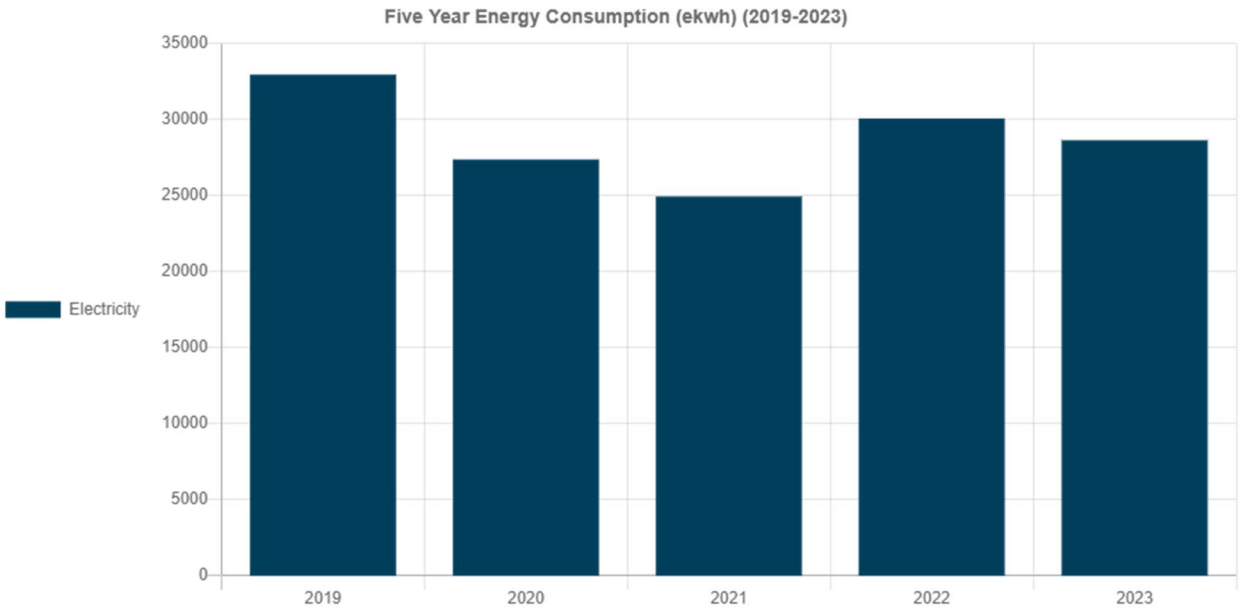
P0M 2W0

Town Street Lights

0 square meter floor space

2920 Annual Hours of Operation

Over the past 4 years this asset has decreased energy consumption by 13.2%



Wellness Centre

1 King St East

St.-Charles ON

P0M 2W0

Multi use facility.

1130 square meter floor space

6570 Annual Hours of Operation

Over the past 4 years this building has decreased energy consumption by 16.6%