

Energy Conservation and Demand Management Plan Update



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Executive Summary

The Town of Ajax's Corporate Energy Management Plan was developed to meet the reporting requirements for the provincial *Green Energy Act* (Ontario Regulation 397/11).

On January 1, 2019, Ontario Regulation 397/11 under the *Green Energy Act* was revoked and replaced with Ontario Regulation 507/18: *Broader Public Sector: Reporting and Conservation and Demand Management Plans* under the *Electricity Act*. As a result of this change, the reporting requirements were transferred from the *Green Energy Act* to the *Electricity Act*.

Ontario Regulation 507/18 requires all public agencies in Ontario to prepare, publicly report, and implement energy conservation and demand management plans. The regulations also requires annual reporting of energy consumption and greenhouse gas (GHG) emissions. The energy conservation and demand management plans were required by July 1, 2014 and every fifth anniversary thereafter.

The regulation requires every public agency to publish on its website and intranet site all of the information required under subsection (1) of Ontario Regulation 507/18 and the following information:

1. A description of current and proposed measures for conserving and reducing energy consumption and managing the demand for energy.
2. A revised forecast of the expected results of the current and proposed measures.
3. A report of the actual results achieved.
4. A description of any proposed changes to be made to help the Town to reach any targets it has established, or forecasts it has made.

This update to the energy conservation and demand management plan will provide an analysis of the Town's current energy use and GHG emissions in order to determine what further steps can be taken to reduce corporate energy use and GHG emissions. The plan will assist in providing a framework for the Town to continue to implement energy conservation measures.



Background

The Town of Ajax is located within Durham Region in Southern Ontario. It is situated in the Eastern end of the Greater Toronto Area on the shore of Lake Ontario. The population of Ajax is 119,677 (based on the 2016 census) with a land area of 67.07 km². Ajax is also home to one of the fastest growing populations in the eastern Greater Toronto Area, with the population growing four times faster than Canada as a whole. This population growth means it is that much more important to focus on energy conservation and management.

The municipality published the Corporate Energy Conservation and Demand Management Plan in 2016 for the timeframe of 2016-2020. This was prepared in compliance with O.Reg 397/11 under the Green Energy Act. The goal of the plan was to make Ajax a more energy efficient Town by increasing the use of energy efficient technology and reducing overall energy consumption.

The primary focus of the Energy Conservation and Demand Management Plan is the energy consumption of municipally owned and operated buildings via heating and cooling as well as water usage. The Town of Ajax has 48 buildings including municipal buildings, community centres, libraries, recreation buildings and fire stations. The second largest contributor to energy consumption throughout the Town is outdoor lighting, including streetlights, traffic lights, parks and outdoor sportsfields lights. The final component to the plan outlines the Town's fuel consumption and the greenhouse gas emissions related to fuel.

The information in this updated plan can be used by Town Staff and Council to understand the current energy use of the Corporation, as well as how to move forward on future energy conservation plans and initiatives.

Greenhouse Gas Emissions (GHG)

The Town of Ajax is currently involved with a number of GHG reduction initiatives that contribute to the overall environmental goals of the municipality. In 2011, the Town joined the Partners for Climate Protection (PCP), which is a program supported by the Federation of Canadian Municipalities (FCM) and ICLEI-Local Governments for Sustainability. The PCP program is a network of municipalities that work to learn how to reduce their GHG emissions and prevent climate change. The program utilizes a five-step milestone framework that helps municipalities take the necessary steps to act on climate change and reduce emissions. The milestones are:

1. Create a GHG Emissions Inventory and Forecast
2. Set GHG Emissions Reduction Targets
3. Develop a Plan to reduce GHG Emissions
4. Implement the Plan
5. Monitor Progress and Report Results

The Town of Ajax has set a goal of reducing corporate GHG emissions by 20% by 2020. This target is based on the greenhouse emission baseline year of 2005. As of 2017, the Town of Ajax reached and achieved the milestones for both the community and corporate categories.

The Town has implemented a number of energy reduction projects such as the construction of LEED facilities, solar photovoltaic, solar thermal and geothermal systems as well as various facility energy retrofit upgrades. The Town has installed Electric Vehicle (EV) charging stations, completed the streetlighting LED conversion and acquired a fleet of green vehicles in an effort to reduce energy consumption and GHG emissions.

Any future actions to be pursued by the Town must be manageable and achievable within the financial constraints of the Town. Staff have worked through the budget process framework to ensure that energy conservation actions are sustainably managed. The Town continually pursues available grant or incentive programs available to help offset capitals costs associated with these actions.

The largest tool available for the Town to identify and develop energy conservation measures is the ability to monitor energy use and consumption including electricity, natural gas, and corporate fuel. The Energy Conservation and Demand Management Plan identifies actions in the following areas:

- Energy conservation in existing facilities
- Facility operations
- Sustainable buildings
- Renewable energy
- Street and traffic lighting
- Fleet energy conservation
- Energy tracking and metering
- Building automation
- Long-term sustainability
- Energy training and awareness
- Financial considerations

The Town conducted an analysis of its 2018 GHG emissions of corporate operations. This analysis showed that the Town's electricity use for facilities is the largest contributor followed by diesel fuel, outdoor lighting, natural gas consumption for facilities and gasoline fuel.

The Town of Ajax is committed to energy conservation and reducing the impacts of GHG emissions through its strategic goals and policies by implementing energy management in the Town's daily Operations. As energy costs

continue to rise for electricity, natural gas, water, and fuels they have an increasingly significant impact on the Town's annual operating budget. Managing and reducing energy consumption throughout Town facilities will help to protect the corporation from these rising costs and prevent the environmental damage that results from energy use.

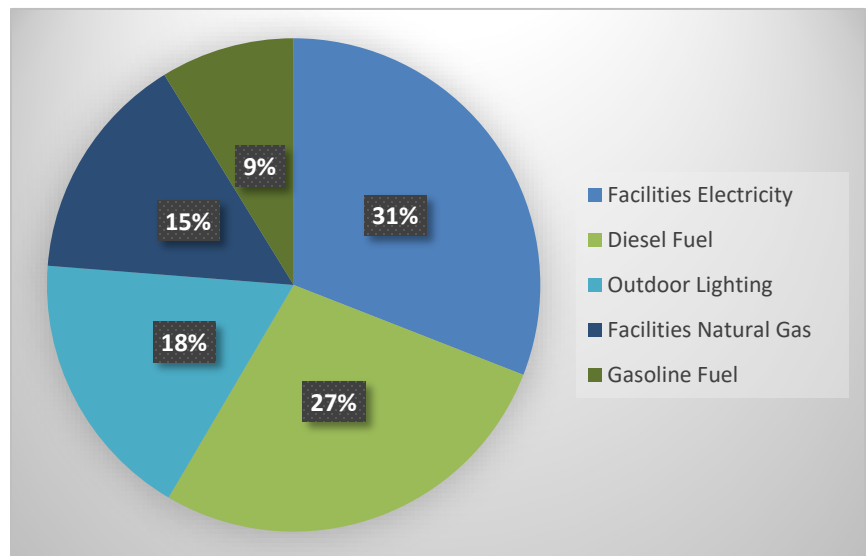


Figure 1 2018 Greenhouse Gas Emission Sources

Introduction

The Corporate Energy Conservation and Demand Management Plan was formed to help Ajax have a better understanding of our energy consumption and to manage it accordingly. This updated plan will provide a current look at how the Town is doing in terms of GHG emissions and energy consumption reduction initiatives.

This plan update ensures that the Corporation is meeting the requirements under Ontario Regulation 507/18 (formerly Ontario Regulation 397/11) where public agencies, including municipalities, must publish the following information on its website, intranet site, and in print:

- A description of current and proposed measures for conserving and reducing energy consumption and managing demand for energy
- A revised forecast of the expected results of the current and proposed measures
- A report of the actual results achieved
- A description of any proposed changes to be made to assist the public agency in reaching any targets established or forecasts made

The Energy Conservation and Demand Management Plan Update will be utilized to help the Town to meet energy conservation goals, monitor progress, and implement new strategies that will help Ajax become a more sustainable municipality.

Profile

The Town of Ajax currently operates 48 different facilities and has compiled building data on these existing facilities such as the energy consumption, operating costs, capital replacement costs and equipment inventories.

All of the municipal streets within the Town have streetlights that are owned and operated by the Town and included in our asset inventory. Additionally, there are many parks and open spaces consisting of playgrounds, trails, community gardens, splash pads, and sports fields within the Town. These areas have walkway lighting, parking lot lighting, and sportsfield lighting, all of the outdoor lighting is incorporated into the Town's overall energy consumption.

Supporting the Town wide operations is a large fleet of vehicles and equipment that ranges in type and style from small hybrid vehicles to large trucks used for snow removal. There are also a number of smaller pieces of equipment used in operations such as chain saws and grass trimmers that use fossil fuels to operate.

Vision

Developing a culture of energy conservation and reducing the demand for energy production to minimize greenhouse gas emissions while improving air quality is the desired state for the future energy use in the Town of Ajax.

The Energy Management Plan Update must be revisited and updated every five years from its implementation date of July 1st, 2014 as per O.Reg 507/18. This document serves as the first update to occur on the initial plan since its implementation. The baseline year of 2011 was chosen for the Town of Ajax's inventory based on the reporting requirements of the first year of the regulation.

This energy plan update lays out the Town's current strategies to reduce energy consumption and GHG emissions across the municipalities operations, which includes buildings, street lights, vehicles and equipment. This update will serve as a guide for the Town to assist in ensuring that Ajax can continue to lead in the areas of energy management, energy conservation, and strive to ensure a reduction in energy costs.

The following long-term vision and goals were included in the original Energy Conservation and Demand Management Plan, and are listed here again to ensure that they are being considered in all new energy initiatives moving forward. The vision and goals were developed to complement and enhance the existing strategic direction that has been adopted by the Town of Ajax in regard to:

- Development;
- Sustainability;
- Greenhouse gas emissions;
- Transportation; and
- Enhancement and protection of the Town's urban forest canopy

Vision

**"A vibrant and caring community where people and history connect
Surrounded by natural beauty where open spaces and unique landscapes set us apart
Rich in opportunity where ideas and innovation flourish
Experience it- Ajax".**

Mission Statement

"To educate, inspire, and empower our community to act sustainably for the benefit of current and future generations through a responsible balance of Ajax's environmental, social/cultural and economic needs."

Goals

Air Quality

In 2055, the Town will have good quality air that is clean to breathe and supports healthy ecosystems.

Energy

In 2055, the Town will conserve the amount of energy we consume and will generate most of the energy that we consume from clean and renewable sources.

Transportation

In 2055, the Town will have an integrated, efficient, and accessible transportation system that has sustainable options available for the movement of people and goods within the community and beyond.

Greenhouse Gas Emission Reduction

The Town will reduce the amount of GHG emissions corporately 20% by 2020

The Town implemented the following strategies to reduce both the corporate and community GHG emissions identified in the Integrated Community Sustainability Plan (ICSP):

- Proactively control air pollutants generated from corporate facilities and operations
- Reduce air pollution
- Reduce the amount of energy that the Town facilities use in their operations
- Increase the community's energy supply needs through renewable sources
- Use vehicles that are energy efficient and use alternative fuel sources
- Reduce utility costs

The targets set in the ICSP identified the Town would reduce **corporate** GHG emissions by 20% below the 2005 baseline levels and reduce **community** GHG emissions by 6% by the year 2020, both of those target were met in 2017.

The overall goal for the Town of Ajax will be to further pursue energy conservation in all municipal buildings, streetlighting and fleet operations through the capital project and planning process.



Energy Conservation and Demand Management Plan 2019 Update

Strategic Initiatives Related to Energy Conservation

The Town of Ajax demonstrates its commitment to the conservation of energy and reduction of GHG emissions to help reduce the environmental and cost impact on the Town. These commitments are highlighted throughout numerous strategic goals and policies. The Town of Ajax has the following initiatives relating to energy conservation strategies:

Urban Forestry Management Plan (2011)

The Town of Ajax's Urban Forestry Management Plan, was adopted in June of 2011. This plan lays out the steps necessary to realize the Town's vision for a healthy and sustainable urban forest which supports a thriving and livable community. Guided by the vision, a mission statement and six strategic objectives, the plan provides 32 recommendations for implementation, as well as future directions for implementation within a broader 20 year framework.

Currently Ajax's urban forestry accounts for 18.4% of Ajax's total area. Benefits of this Urban Forest Plan include reduction of "heat island effect". Trees provide substantial cooling benefits in urban centres through direct and indirect cooling through the absorption of sunlight, thus providing shade. By shading buildings, they can reduce the amount of energy used to operate air conditioners, reducing GHG emissions and improve air quality.

Carbon storage is also another benefit of the Urban Forest plan. Through the normal respiratory process, trees are able to absorb GHG's. Ajax's urban forest sequesters an estimated 2,784 tonnes of carbon annually (net). Another 105,000 tonnes are already stored in standing trees in Ajax.

Integrated Community Sustainability Plan (ICSP) (2013)

In 2013, the Town of Ajax implemented the ICSP. This plan defines the Town's vision for achieving sustainability both within the corporation and the community by 2055. Within the plan are goals and directions and actions for balancing the environmental, social, cultural and economic pillars of sustainability. Long term and short term goals have been set in air pollution, energy and transportation.

The ICSP also incorporates both Community and Town of Ajax Corporate Local Action Plans (LAPs) which include actions to reduce GHG emissions as part of the Town's commitment to the Partners for Climate Protection Program (PCP).

Local Action Plan (2013)

In July of 2010 the Town of Ajax joined hundreds of other municipalities in the Partners for Climate Protection (PCP) program led by the Federation of Canadian Municipalities and ICLEI. The PCP program is based on a five-milestone framework used to guide municipalities to reduce greenhouse gas emissions. The Town of Ajax is committed to greenhouse gas reduction by 20% in municipal operations (corporately) and 6% by the community-at-large by the year 2020. Actions that will guide Ajax into reaching these goals are highlighted in the Town's LAPs.

Official Plan, 2016 Consolidation

This plan defines Ajax's long range goals, objectives and directions in order to coordinate growth and development. Within this plan a number of policies have been implemented to allow Ajax to achieve energy conservation through community and site planning, building design, use of energy-efficient materials, appliances, and landscaping. Some of these initiatives include:

- Advancing environmentally responsible technologies that reduce energy usage while maintaining levels of service for a safe built environment.
- Undertaking energy conservation measures, including the use of energy efficient building materials, designs and equipment in municipal facilities to reduce energy consumption.
- Develop and implement air quality strategies and programs to reduce greenhouse gas emissions from Town-owned facilities and municipal activities.
- Support incremental reduction of greenhouse gas emissions and air pollutants generated by municipal facilities and activities.
- Encourage the provision of renewable energy sources (i.e., other than fossil fuels) for both facilities and fleet.
- Increasing tree canopy coverage.
- Promoting sustainable modes of transportation.

Corporate and Community Greenhouse Gas Inventory and Trends: 2015 (2017)

This report was generated as part of the framework from the network of Partners for Climate Protection (PCP). The Town of Ajax published this report in order to achieve Milestone 5: Monitoring Progress and Reporting Results, which requires both a corporate and community GHG emissions inventory. The Town used 2015 as the year to conduct the inventory, and completed the milestone in 2017. The results of the inventory demonstrate that the Town has met the 6% GHG emissions reduction target set in 2005.

Integrated Transportation Master Plan (ITMP) (2019)

The Town's ITMP vision is to enhance the sustainable and multi-modal transportation system for the Town of Ajax by planning, designing, constructing and maintaining a community and transportation network that supports pedestrian, cyclists, transit and vehicular traffic. The Town's transportation system will be accessible to all users and all modes of transportation. A number of action items identified within the plan directly to support the vision of the plan.

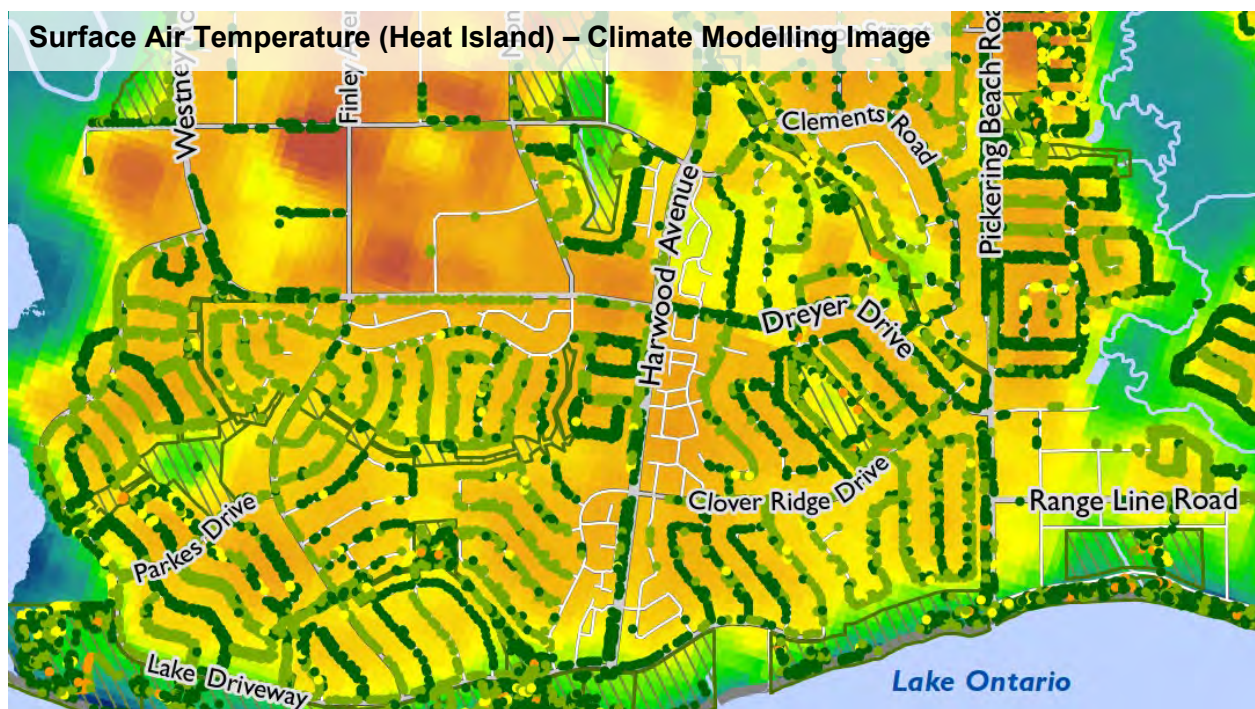
Durham Community Energy Plan (2019)

The Durham Community Energy Plan was endorsed by the Durham Regional Council on April 24, 2019. The goal of the plan is to guide the development, storage, and transmission of energy in communities and to optimize the related economic, environmental, health, and social benefits. The objective of the plan is to accelerate the transition to a clean energy economy in Durham Region while maintaining and expanding economic, environmental, and social benefits. The Plan

is expected to move into the implementation stage where new organizations and alliances may be required to effectively achieve the goals of the Plan.

Ajax Climate Risk & Resiliency Plan (ACRRP) (2019)

The ACRRP and associated Implementation Strategy were adopted by Council on June 17, 2019. The implementation strategy will provide the Town with strategic planning framework for addressing current and predicted future climate change risks. The impacts of extreme weather events that Ajax has experienced to date include localized flooding; significant drought; ecosystem changes; violent storm damage; and disruptions to electricity supply, transportation and communication services. The foundation for climate adaptation planning is an understanding of the risks that threaten a community. The ACRRP represents an important tool that will be used to directly support the Town's Asset Management Plan and long-term budget forecast for matters that are specifically related climate resiliency.



Current Energy Use

The Town of Ajax must consume energy in order to carry out the operation and maintenance of buildings, fleet, equipment, and streetlights. The fuel that supplies this energy comes from a variety of sources, including grid supplied electricity (primarily nuclear generated), natural gas, oil, gasoline, and diesel. Within the Town, hydro power is provided by Elexicon Energy, gas is provided by Enbridge, and water is provided by the Region of Durham.

The baseline year of 2011 was used to determine Ajax's current state of energy consumption as it was the first year that the Ministry of Environment required the Town to report energy consumption under O.Reg 397/11 (now O.Reg 507/18 under the Electricity Act). This inventory provided the Town with the baseline data for measuring the implementation success of the goals set out within the original Energy Conservation and Demand Management Plan.

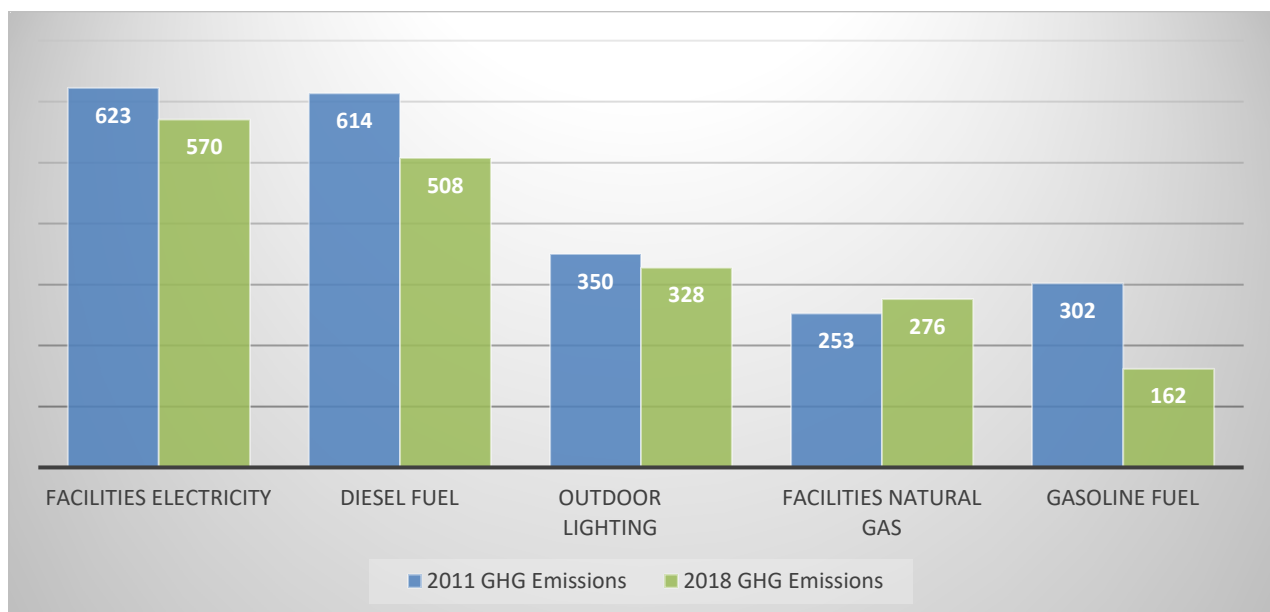


Figure 2 Corporate 2011 GHG Emissions vs 2018 GHG Emissions

The Town has seen a reduction in GHG emissions related to our facilities, outdoor lighting and fleet fuel consumption by 259 tonnes from our baseline year of 2011 to 2018.

Greenhouse gas calculations were produced by calculating:

$$\text{Fuel Consumption} \times \text{GHG Emission Factor}$$

(National Inventory Report, 2017)

Facilities

The Town of Ajax owns approximately 48 facilities with an estimated 745,000 sq.ft. interior area. There are 20 facilities owned and operated by the Town that fall under O.Reg 397/11 and therefore the Town is required to submit annual energy consumption data of these facilities to the Ministry of Energy. Town of Ajax Facilities are responsible for approximately 46% of the total GHG emissions, comprised of emissions from electricity use and natural gas.

Energy Conservation and Demand Management Plan 2019 Update

In 2019, the Town of Ajax undertook energy audits of the Town's larger facilities. The following tables outline the reported consumption levels of electricity, natural gas, and water consumption of each facility as well as the annual costs.

Table 1 Facility Electricity Consumption*

Facility	Consumption	Cost
Ajax Community Centre	4,492,970 kWh/year	\$576,952 /year
Ajax Municipal Building	859,072 kWh/year	\$119,411 /year
Audley Recreation Centre	1,773,975 kWh/year	\$210,794 /year
Carruthers Creek Pavilion	75,045 kWh/year	\$8,292 /year
Fire Headquarters	450,142 kWh/year	\$53,297 /year
Fire Station #1	107,439 kWh/year	\$12,141 /year
Fire Station #2	225,458 kWh/year	\$27,371 /year
Greenwood Pavilion	54,918 kWh/year	\$5,758 /year
Main Library	319,189 kWh/year	\$52,826 /year
McLean Community Centre	1,419,114 kWh/year	\$185,478 /year
Operations Centre	719,075 kWh/year	\$93,983 /year
Rotary Park Pavilion	98,976 kWh/year	\$11,828 /year
St. Andrews Community Centre	162,284 kWh/year	\$19,101 /year
St. Francis Centre	116,526 kWh/year	\$14,775 /year

Table 2 Facility Natural Gas Consumption*

Facility	Consumption	Cost
Ajax Community Centre	539,313 m ³ /year	\$141,534 /year
Ajax Municipal Building	119,449 m ³ /year	\$32,478 /year
Audley Recreation Centre	193,849 m ³ /year	\$50,954 /year
Carruthers Creek Pavilion	N/A	N/A
Fire Headquarters	27,147 m ³ /year	\$9,303 /year
Fire Station #1	22,813 m ³ /year	\$5,548 /year
Fire Station #2	22,935 m ³ /year	\$6,408 /year
Greenwood Pavilion	N/A	N/A
Main Library	34,089 m ³ /year	\$10,131 /year
McLean Community Centre	254,746 m ³ /year	\$68,629 /year
Operations Centre	112,302 m ³ /year	\$30,254 /year
Rotary Park Pavilion	16,668 m ³ /year	\$5,409 /year
St. Andrews Community Centre	38,906 m ³ /year	\$9,252 /year
St. Francis Centre	20,221 m ³ /year	\$4,111 /year

Table 3 Facility Water Consumption*

Facility	Consumption	Cost
Ajax Community Centre	35,551 m ³ /year	\$92,434 /year
Ajax Municipal Building	1,226 m ³ /year	\$3,310 /year
Audley Recreation Centre	44,367 m ³ /year	\$112,693 /year

Energy Conservation and Demand Management Plan 2019 Update

Carruthers Creek Pavilion	7,212 m ³ /year	\$17,309 /year
Fire Headquarters	2,054 m ³ /year	\$5,217 /year
Fire Station #1	613 m ³ /year	\$1,650 /year
Fire Station #2	552 m ³ /year	\$1,484 /year
Greenwood Pavilion	N/A	N/A
Main Library	1,083 m ³ /year	\$2,914 /year
McLean Community Centre	42,134 m ³ /year	\$109,548 /year
Operations Centre	1,649 m ³ /year	\$4,288 /year
Rotary Park Pavilion	582 m ³ /year	\$1,396 /year
St. Andrews Community Centre	234 m ³ /year	\$629 /year
St. Francis Centre	102 m ³ /year	\$273 /year

* 2016 to 2018 consumption data, modelled to a "typical meteorological year" to estimate the "typical year" consumption

Outdoor Lighting

This section includes all streetlights owned and operated by the Town of Ajax as well as various outdoor lighting located around the Town such as streetlighting, traffic lights, parks and sportsfield lighting.

Outdoor lighting operated by the Town of Ajax is responsible for approximately 18% of the total GHG emissions, comprised solely of emissions from electricity use. This is equivalent to the use of 6,555,358 kWh of electricity for outdoor lighting per year.

Streetlighting is the largest source of energy consumption for this sector contributing to 97% of the total outdoor lighting GHG emissions.

The Town has seen a reduction in GHG emissions related to outdoor lighting by 18 tonnes from our baseline year of 2011 to 2018.



Table 4 2018 Outdoor Lighting Electricity Consumption

Lighting Type	Consumption	Cost
Streetlights	6,367,621 kWh	\$1,018,476/year
Parks and Sportsfield Lighting	132,577 kWh	\$49,616/year
Traffic Lights	55,160 kWh	\$23,758/year

Vehicles & Equipment

The current inventory of vehicles is at 159 vehicles and 100 pieces of equipment. These vehicles and equipment use mainly gasoline or diesel fuel as their source of energy. Vehicle and equipment emissions account for 36% of the Town's total GHG emissions. This is equivalent to the combustion of 256,271 liters of fuel.



The primary fuels consumed for the operation of vehicles is gasoline and diesel. The majority of the Greenhouse gas emissions created by the operation of the Town's fleet is within the Operations Department. This is as a result of the use of heavy vehicle equipment such as snow plows, forestry vehicles and construction equipment.

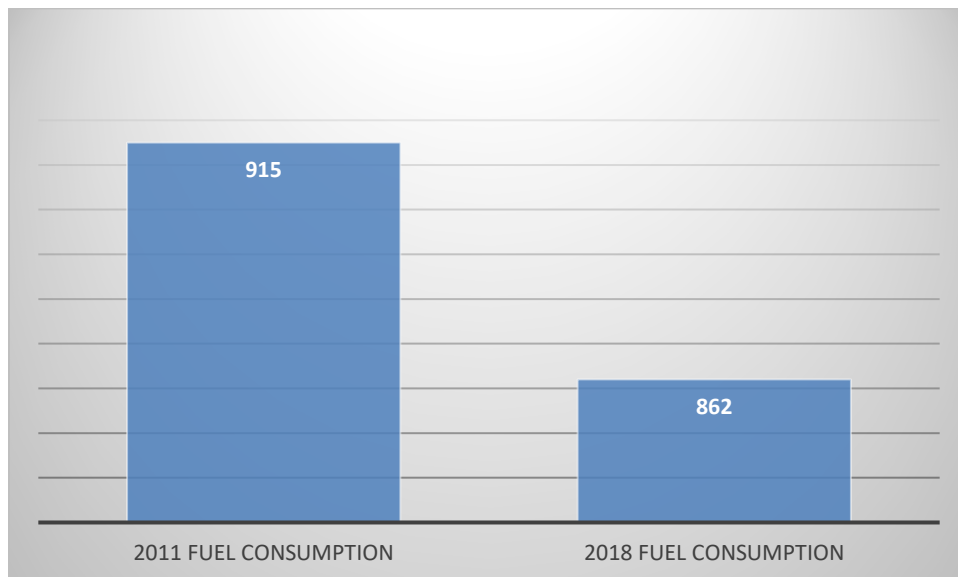


Figure 3 Fleet 2011 GHG Emissions vs 2018 GHG Emissions

The Town has seen a reduction in GHG emissions related to fleet fuel consumption by 53 tonnes from our baseline year of 2011 to 2018.

Implemented Energy Reduction Initiatives

The Town of Ajax has been proactively improving energy efficiency by implementing energy reduction and conservation projects in its facilities, outdoor lighting, and fleet.

Facilities

For many years, the Town of Ajax has been active in reducing energy consumption throughout our facilities. Since the release of the Corporate Energy Management Plan, there have been numerous retrofits and energy saving projects completed at Town facilities. The following projects have been completed between 2017 and 2019:

Table 5 Completed Facility Retrofit Projects 2016-2019

Facility	Project	Year
McLean Community Centre	Domestic Hot Water Boiler Replacement	2017
Ajax Community Centre	Pad 1&2 Refrigeration Plant Replacement	2017
Ajax Community Centre	90,000 sq.ft. Roof Replacement	2017
Fire Station #2	Full Facility LED Lighting Retrofit	2018
Ajax Community Centre	Installation of VFDs & Motors	2018
McLean Community Centre	Installation of VFDs & Motors	2018
St. Francis Centre	Installation of LED Lighting	2018
Hartrick House	Installation of LED Lighting	2019
Audley Recreation Centre	Phase II LEED Facility Expansion	2019

The electricity consumption for the Ajax Community Centre (ACC) and the McLean Community Centre (MCC) has been analyzed to demonstrate the reduction in consumption from 2011 to 2018, refer to Figure 2.

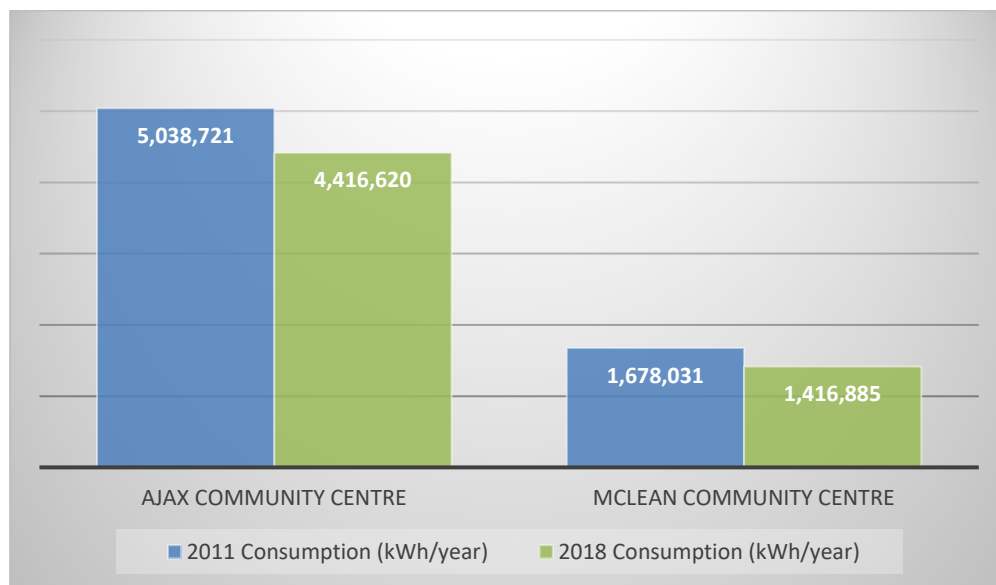


Figure 4 Electricity Consumption Reduction ACC & MCC 2011 vs 2018

There are 20 facilities owned and operated by the Town that fall under the O.Reg 397/11 reporting requirements. These facilities have had a reduction in total electricity consumption by 1,200,268 kWh, or 60 tonnes of CO₂e from the baseline year to 2018.

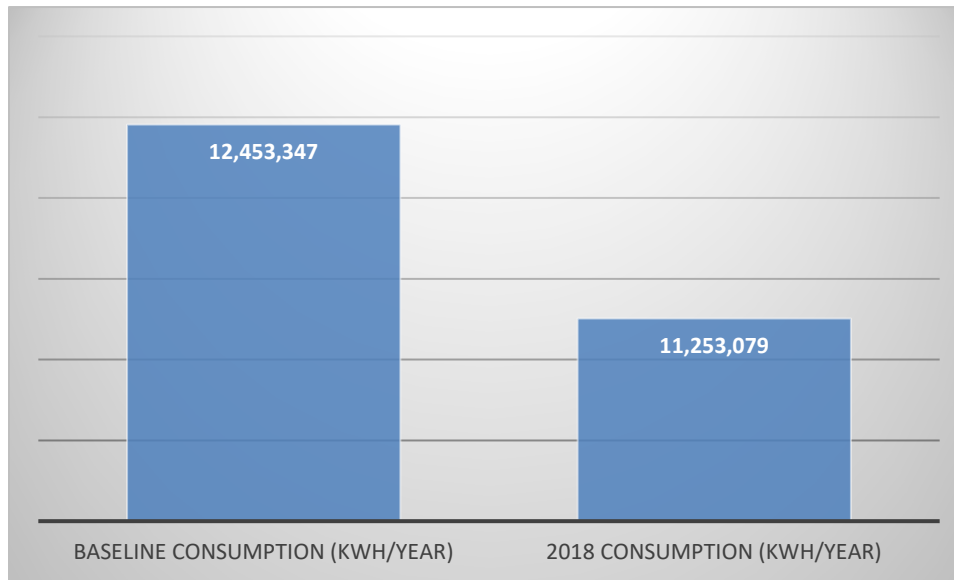


Figure 5 Total Electricity Consumption Reduction of 20 Facilities

Lighting

In 2013, the Town completed a Streetlight Inventory and Assessment of all Town owned streetlights. The project included accurate counts and conditions of all town streetlights and poles as well as providing information on types of poles, types of fixtures, maintenance recommendations and GIS mapping of all lights.

In 2016, Ajax Council endorsed a streetlight conversion strategy that will replace all cobra head HPS (high-pressure sodium) streetlights to light-emitting diode (LED) fixtures between 2017 and 2021. It is estimated this conversion will reduce the Towns electricity consumption by 26% with an equivalent greenhouse gas emission reduction of 156 metric tons.

In addition to LED streetlight conversions the Town has completed a number of lighting conversion in outdoor spaces including parks, trails and parking lots.

Table 6 Completed Outdoor Lighting Retrofit Projects 2016-2019

Project	Year	Cost
Duffins Greenbelt Pole & Light Replacements	2018	\$111,000.00
MCC Parking Lot LED Lighting Retrofit	2018	\$160,000.00
ACC Parking Lot LED Lighting Retrofit	2018	\$150,000.00
Walkway Pole & Light Replacement	2019	\$51,000.00

Vehicles and Equipment

The Green Fleet Initiative is an effort to transition Town vehicles towards more environmentally friendly options. The components to this initiative include:

- The transition of town vehicles to hybrid vehicles,
- "Right-sizing" the fleet, and,
- An anti-idling campaign.

In order to implement the Green Fleet Initiative, the Town strives to replace vehicles with hybrid, electric or clean diesel when at all possible. When purchasing a new vehicle, the Town also includes tender specifications surrounding vehicle and/or equipment emission levels.



Table 7 Completed Electric Vehicle (EV) Charging Stations

Facility	Project	Year
McLean Community Centre	2 Dual EV charging stations	2018
Ajax Community Centre	2 Dual EV charging stations	2018
Audley Recreation Centre	2 Dual EV charging stations	2019



Previously Implemented Energy Reduction Initiatives

The initial Energy Conservation and Demand Management Plan outlined the following energy reduction initiatives

- Anti-Idling By-Law (2009)
- Smart Commute (2012)
- Green Procurement Policy (2013)
- Green Fleet Initiative
- Energy Data Collection
- Equipment Metering
- Building Automation Systems
- LED Streetlight Conversion Strategy

As of 2019, all of these initiatives are still in place in the Town of Ajax and have not undergone any significant changes since their implementation.



Current Energy Conservation Measures

The Town has been proactively improving building efficiency by implementing energy reduction and conservation projects in our facilities, lighting, and fleet. The following is a list of the energy conservation measures implemented by the Town:

Audley Recreation Centre: 1955 Audley Rd. N – LEED Gold

- A white roof is used to reflect the sun's heat and reduce the urban heat island effect
- Heating and cooling equipment that minimizes ozone depletion
- Occupancy and day light sensors
- An 83m² solar roof mounted thermal system that heats water used within the building
- A 225m south facing solar wall preheats air before it enters the building's air handling units
- CO₂ sensors are connected to a demand-controlled outdoor air delivery system that reduces heating and cooling costs during high occupancy times
- Double glazed windows with an argon fill



Operations Centre: 800 Salem Rd N. – LEED Silver

- Green roof system improves the energy performance of the building, reduces the heat island effect, and reduces energy consumption
- Geothermal heating provides the buildings primary source of heating and cooling
- Solar thermal system collects solar energy through panel system and converts this energy to heat water
- Photovoltaic system uses panels to collect energy that is then converted to alternating current as useable electricity and sold to the grid



Fire Headquarters: 900 Salem Rd N. – LEED Certified

- Green roof system provides increased energy efficiency by reducing the room temperature in the summer
- A geothermal heat pump system is used to heat and cool the building, which reduces the need to rely on fossil fuel generated energy
- Double glazed argon filled windows
- Occupancy lighting sensor system
- Insulation and energy efficient HVAC system



Greenwood Discovery Pavilion: 2290 Greenwood Rd.

- Low E. argon filled windows
- Photovoltaic rooftop solar panels
- Upgraded insulation
- Geothermal heating and cooling
- Occupancy sensors on interior lights
- Energy efficient interior and exterior lights
- Low flow or waterless water closets/fixtures
- Solar thermal heating for hot water
- Solar parking lot lighting



Carruthers Marsh Pavilion: 55 Ashbury Blvd. – LEED Certified

- Geothermal heat pump collects heat from the earth in winter and pulls heat from the building in summer
- Occupancy sensor system



Proposed Measures for Energy Conservation

Energy Conservation Recommendations

In 2019, the Town of Ajax retained a consulting firm to conduct energy audits of 14 of the Town's municipal buildings. The energy savings reports were created with the assurance that the recommendations meet the needs and goals of the Town of Ajax. The Town will consider undertaking the proposed energy conservation measures, specifically those that have a low initial investment and a high impact on energy reduction. The Town has incorporated recommendations into the long range capital forecast and will continue to validate and implement energy reduction projects in future capital project planning.

Long Range Capital Forecast (LRCF) Projects

The following is an outline of the future energy conservation measures that are included in the 2020 Capital Budget and 2021-2024 Long Range Capital Forecast. They are broken down by specific buildings, with the project listed alongside the proposed year of implementation and associated cost.

Table 8 Ajax Community Centre Future Projects

Project	Year	Cost (\$)
Replacement of 7 Air Handling Units (Phase I)	2020	500,000
Replacement of 7 Boilers	2021	600,000
Replacement of 5 Rooftop Units	2022	330,000
Facility LED Lighting Retrofit (Phase II)	2022	240,000
Install Demand Control Ventilation	2024	110,000
Replacement of 5 Air Handling Units (Phase II)	2024	385,000
Facility LED Lighting Retrofit (Phase III)	2024	475,000

Table 9 McLean Community Centre Future Projects

Project	Year	Cost (\$)
Replacement of 5 Rooftop Condensing Units	2021	385,000
Replacement Pool Filtration System	2021	550,000
Facility LED Lighting Retrofit (Phase II)	2022	240,000
Roof Replacement & Building Envelope Rehabilitation	2024	1,100,000
Facility LED Lighting Retrofit (Phase III)	2024	475,000

Table 10 Main Branch Library Future Projects

Project	Year	Cost (\$)
Roof Replacement & Building Envelope Rehabilitation	2020	1,650,000
Replacement of 3 Atmospheric Boilers	2022	180,000
Replacement of 3 Rooftop Units & Installation of VFDs	2024	225,000

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Table 11 Town Hall Future Projects

Project	Year	Cost (\$)
Roof Replacement & Building Envelope Rehabilitation	2020	1,650,000
Facility LED Lighting Retrofit	2023	385,000
Energy Upgrades on HVAC System	2024	175,000

Table 12 Fire Station Future Projects

Project	Year	Cost (\$)
Fire Station 2 Heating System Retrofit	2022	315,000
Fire Station 1 Roof Replacement	2024	385,000
Fire Headquarters – Facility LED Lighting Retrofit	2024	220,000
Fire Station 1 Facility LED Lighting Retrofit	2024	220,000

Table 13 St. Andrews Seniors Centre & Gym Future Projects

Project	Year	Cost (\$)
Roof Replacement	2023	700,000
Facility LED Lighting Retrofit	2023	220,000

Table 14 Rotary Park Pavilion Future Projects

Project	Year	Cost (\$)
Energy Upgrades (Boilers, Rooftop Units, LED Lighting)	2024	150,000

Estimated GHG Emission Reduction

The estimated GHG emission reduction of the long range capital projects listed above, identify an overall GHG emission reduction of 75 tonnes of CO₂e and is distributed as follows:

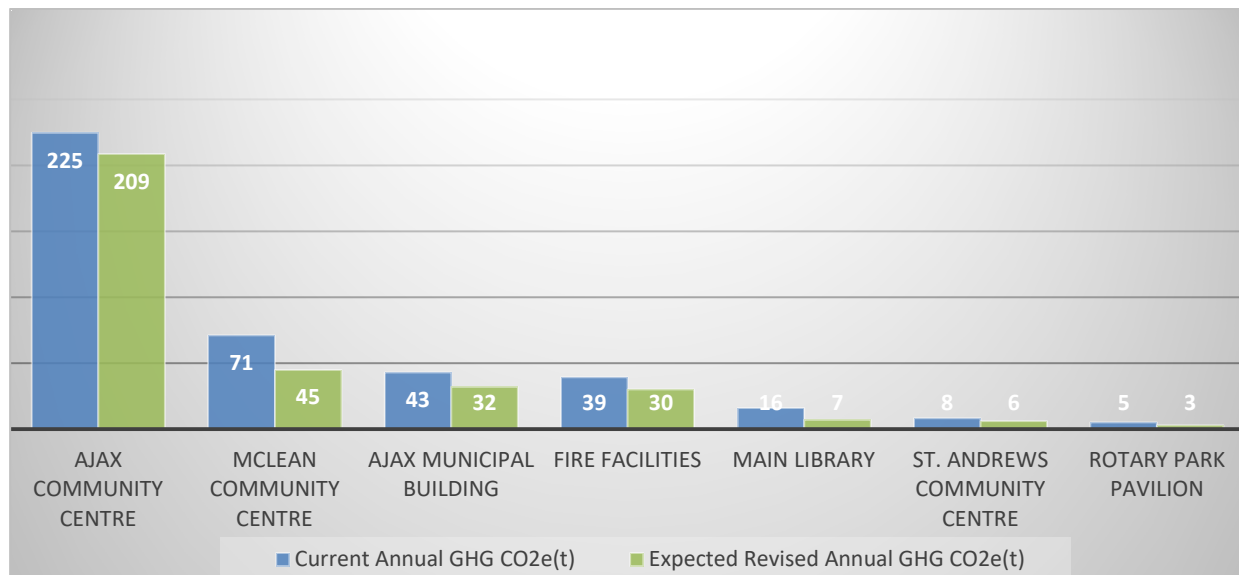


Figure 6 Estimated GHG Emission Reduction of LRCF Projects

Outdoor Lighting

The following is an outline of the future energy conservation measures that are included in the 2020 Capital Budget and 2021-2024 Long Range Capital Forecast. They are broken down by outdoor lighting type alongside the proposed year of implementation and associated cost.

Table 15 Streetlight Future Projects

Project	Year	Cost (\$)
Westney Rd - Rossland to Taunton - LED Streetlights	2020	575,000
Neighbourhood LED Streetlights	2020	510,000
Neighbourhood LED Streetlights	2022	310,000
Neighbourhood LED Streetlights	2023	375,000

Table 16 Walkway Lighting Future Projects

Project	Year	Cost (\$)
LED Walkway Lighting Replacements	2023	150,000
LED Walkway Lighting Replacements	2024	230,000

Table 17 Parking Lot Lighting Future Projects

Project	Year	Cost (\$)
Town Hall Parking Lot - LED Lighting Improvements	2022	244,000
McClarnan Parking Lot - LED Lighting Improvements	2023	30,000

Table 18 Sportsfield Lighting Future Projects

Project	Year	Cost (\$)
Harwood South Field Lights - LED Lighting Improvements	2023	400,000

Table 19 Park Lighting Future Projects

Project	Year	Cost (\$)
Eagle Woods Parkette - LED Lighting Improvements	2021	16,000
Roland Michener Park - LED Lighting Improvements	2021	16,000
Westney Heights Park - LED Lighting Improvements	2023	15,000
Daste North Parkette - LED Lighting Improvements	2023	16,000
Meadows North Park - LED Lighting Improvements	2023	36,000
Remmer Park & Trail - LED Lighting Improvements	2024	70,000
Fieldgate Homes Parkette - LED Lighting Improvements	2024	15,000

Fleet

The following is an outline of the future fleet replacements and acquisitions in keeping with the energy conservation measures that are included in the 2020 Capital Budget and 2021-2024 Long Range Capital Forecast. They are broken down by type of vehicle, proposed year of implementation and associated cost.

Table 20 Fleet Future Replacements

Year	Vehicle Type	Cost (\$)
2020	Pumper Rescue Truck	915,000
	Utility Vehicle*	35,000
	Plant Steamer*	80,000
	Reel Stripper Mower*	100,000
	2 Single Axle Snow Plow	590,000
	Crew Cab Pickup with Plow	70,000
	Crew Cab Pickup Truck	45,000
	Parks Maintenance Van	55,000
	Stake Truck	80,000
	Tractor with Cab & Loader	60,000
	Front Runner Units	105,000
	Utility Vehicle	35,000
	Building Maintenance Van*	63,000
	Crew Cap Pickup	70,000
	Police Interceptor Car	52,000
2021	4 Stake Trucks	340,000
	2 Large Area Mower	250,000
	2 Front Runners	70,000
	3 Sidewalk Tractors	165,000
	2 Trades Van Units	130,000
	Street Sweeper*	285,000
	2 Deputy Chief Cars	104,000
	2 Mini Vans	87,000
	SUV Response Vehicle	88,000
	Single Axle Snow Plow*	295,000
2022	Fleet Service Truck*	85,000
	3 Crew Trailers	30,000
	Single Axle Snow Plow	300,000
	2 Pickup Trucks	140,000
	2 Stake Trucks	170,000
	ByLaw Hybrid Car	38,000
	ByLaw Pickup Truck	45,000
	2 Hybrid Cars	76,000
	Sedan Car	35,000
	Library Van	43,500

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2023	Pumper Apparatus Unit	1,100,000
	5 Ton Plow Tuck*	285,000
	Sidewalk Tractor Plow*	165,000
	Van*	55,000
	Pickup Truck*	45,000
	Single Axle Snow Plow	300,000
	4 Pickup Trucks	211,000
	2 Crew Cab Stake Trucks	170,000
	Trackless Articulate Tractor	135,000
	Trades Van	65,000
	Hybrid Sedan	38,000
	3 Crew Trailers	30,000
	Asphalt Roller	25,000
	Water Trailer	15,000
	2 ByLaw Pickup Trucks	90,000
	2 Crew Cab Pickup Trucks	90,000
	Pickup Truck	45,000
	3 Hybrid Sedans	105,000
	Pumper Apparatus Unit	1,140,000
2024	2 ByLaw Vans	80,000
	2 Hybrid Sedans	76,000
	Hybrid Sedan	38,000
	Crew Cab Pickup Truck	77,000
	Aerial Fire Apparatus Unit	875,000
	Pumper Rescue Truck*	385,000
	4 Van & Crew Cab Pickup Trucks	240,000
	7 Zero Turn Mowers	245,000
	2 Trackless Machines	270,000
	2 LAM Mowers Units	250,000
	5 Sportsfield Mowers	127,000
	Crew Cab Truck	100,000
	Hybrid Sedan	38,000

*Denotes additional vehicle acquisitions to the fleet

Table 21 EV Charging Stations Future Installations

Project	Year	Cost (\$)
Town Hall Parking Lot - EV Charging Stations	2022	60,000

Policy, Education & Awareness Action Items

Staff and facility users play a significant role in reducing the Town of Ajax's energy consumption. In order to ensure that energy conservation remains a top priority a number of initiatives have been identified to help adjust behavior.

Policy

- Ensure that energy conservation is considered during the creation and review of all corporate plans and strategies.
- Continue the Town's commitment toward the Partners for Climate Protection program through the implementation of the Corporate Local Action Plan.
- Update the Green Procurement Policy on a regular basis to encourage the procurement of newly developed technologies.
- Require specifications for new acquisitions to reflect the lowest energy/ fuel consumption currently available in the industry.
- Continue to ensure that trees and shrubs are planted in ways that promote shading on hard surfaces and help reduce the heat island affect.

Operating Behavior

- Provide ongoing training to Staff on new energy equipment and operating procedures.
- Ensure that daily operating procedures address energy efficiency for building systems.
- Ensure the Building Automation System is utilized to ensure maximum efficiencies.
- Continue to implement power management on computers and electronic equipment.

Educational Initiatives

- Continue to promote and educate staff on energy awareness and conservation behavior within the corporation.
- Expand existing corporate vehicle anti-idling program to include ongoing education for seasonal and new hire training.
- Promote staff use of teleconferencing, carpooling and sustainable modes of transportation to reduce fuel consumption pertaining to travel.

Implementation

Roles and Responsibilities

In order to reduce energy consumption across all corporate assets, the Town will continue to support the implementation of projects and initiatives highlighted within the Corporate Energy Conservation Demand Management Plan.

Staff Engagement

As part of its corporate environmental initiatives, the Town will promote ongoing staff training and awareness pertaining to effective energy management.

Corporate energy and environmental initiatives will be developed and promoted by the Town to encourage energy conservation and environmental stewardship among municipal Staff. Initiatives may include:

- Energy behavior awareness campaigns.
- Bike to work days.
- Recognition of Earth Hour and Earth Day.
- The promotion of works undertaken by corporate energy ambassadors and/or departmental “green team” members.

While such initiatives may not all have a direct connection to energy conservation within corporate operations, these initiatives should serve to keep the issue of energy conservation and GHG reduction top-of-mind for Town Staff and will help promote a corporate cultural change and foster support for other energy, GHG and environmental initiatives across the corporation.

Workplan Development

An annual work plan will comprise of actions identified within the annual Capital Budget and Integrated Community Sustainability Plan. These plans capture actions that are to be used by the Town to manage its contributions to Energy Conservation and provide the details required to drive and report actions highlighted within the Corporate Energy Demand Management Plan.

Financial considerations

In order to implement the future projects identified within this plan for facilities, lighting and fleet the Town of Ajax will require funding totaling \$26,974,500 between the years 2020- 2024.

Future energy projects that will be pursued by the Town must be manageable and achievable within the Town’s financial constraints. Town Staff will work through the budget process framework to ensure that it is a sustainable process.

Incentives

Several external incentive programs exist to support the funding of energy conservation projects. Programs are available through the Town's electrical and natural gas distribution utility providers as well as provincial and federal incentive programs.

The Town will investigate the use of these incentive programs as part or any retrofit or replacement of equipment to see if they qualify for the external funding source.

Measuring and Reporting

Measuring and reporting our progress shows us how well we are conserving energy and the reduction of greenhouse gas emissions. In order to comply with the Electricity Act, the Town submits energy consumption data to the Ministry of Environment on an annual basis. Through this reporting structure a quantitative progress report is generated that measure the amount of energy consumed and quantity of GHG emissions created.

Reporting Progress

Staff will regularly report on the progress of energy consumption and GHG emission reduction to Council through the five year update required under the Act of the Energy Conservation and Demand Management Plan. The plan provides status updates on the progress of proposed and implementation actions as well as identifying new actions that will support energy conservation within the corporation.

Review of the Plan

The Energy Conservation and Demand Management Plan will be reviewed and updated every five years. The purpose of this review is to engage Town Staff, Council and our community members in energy conservation and review the successes achieved and identify expected outcomes for the next five years.

Conclusion

The Town of Ajax is committed to reducing the energy consumption of municipal activities through energy management initiatives and retrofits.

The Energy Conservation and Demand Management Plan identifies ideas and plans to guide the Town towards reducing our consumption across Town facilities, outdoor lighting and vehicle & equipment use. This updated plan has demonstrated the previously implemented ideas have yielded a variety of results that have contributed to the reduction of energy use by the Town.

The 2019 updated plan will continue to guide the Town in becoming a more sustainable municipality by reducing our energy consumption.