Pelham
NIAGARA

| Energy Management Plan |

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June 26, 2019

TOWN OF PELHAM

Energy Conservation and Demand Management Plan

Introduction

Electricity Act, 1998

The Town of Pelham is required under the *Ontario Regulation 507/18* of the Electricity Act, 1998 to complete an annual report of energy consumption and greenhouse gas emissions (GHGs) from its operations and facilities. The purpose of this regulation is to help promote sustainable energy use practices across the province and to help reduce anthropogenic sources of GHGs. The provision of this regulation on December 14, 2018 replaces previous legislative reporting requirements set out by the *Green Energy Act, 2009*, which were repealed as of January 1, 2019.

In addition, to reporting annual energy consumption and greenhouse gas emissions, the Town of Pelham is required to develop an energy conservation and demand management plan in accordance with *Section 25.35.2* of the act. This plan will be developed for the Town of Pelham in accordance with all requirements set out by the *Ontario Regulation 507/18*.

Greenhouse Gas Pollution Pricing Act, 2019

As of April 1, 2019, the Town of Pelham is required under the Federal *Greenhouse Gas Pollution Pricing Act* to pay a surcharge on greenhouse gas emissions produced from Town facilities and operations. The purpose of this Federal Act is to support clean growth, reduce environmental impacts and mitigate the potential negative impacts of climate change. The Federal greenhouse gas emission pricing has been mandated for the province of Ontario and all other provinces that lack a provincial greenhouse gas emissions pricing system. It is required for Ontario and all of its municipalities to participate in the Federal-pricing scheme and closely consider the economic impacts of the increases in natural gas and electricity prices.

Under the *Greenhouse Gas Pollution Pricing Act*, all consumption of fuel for energy in Ontario will be subject to the Federal tax surcharge. It will reflect in a charge of $20 per tonne of carbon dioxide equivalent (CO_2e) in 2019 and rising by $10 per tonne annually and up to $50 per tonne by 2022. Therefore, in the 2019 fiscal year, natural gas consumption will be charged at an additional $0.0391 per cubic meter and annually increasing to a cost of $0.0979 per cubic meter by 2022 (Greenhouse Gas Pollution Act, 2019).

Introduction to the Energy Conservation and Demand Management Plan

The purpose of the Energy Conservation and Demand Management (CDM) Plan is to meet regulatory requirements while also improving facility sustainability. The plan considers current energy management practices, energy conservation efforts, and integrated energy measures that are relevant to Town facilities and operations. Moreover, this plan aims to maximize operational productivity in municipally owned facilities, minimize energy costs and reduce negative social, environmental and economic impacts.

The framework of the CDM plan is demonstrated in **Figure 1**. It includes the Town's vision and policy statement, specific goals and objectives, and a 4-year reduction target.

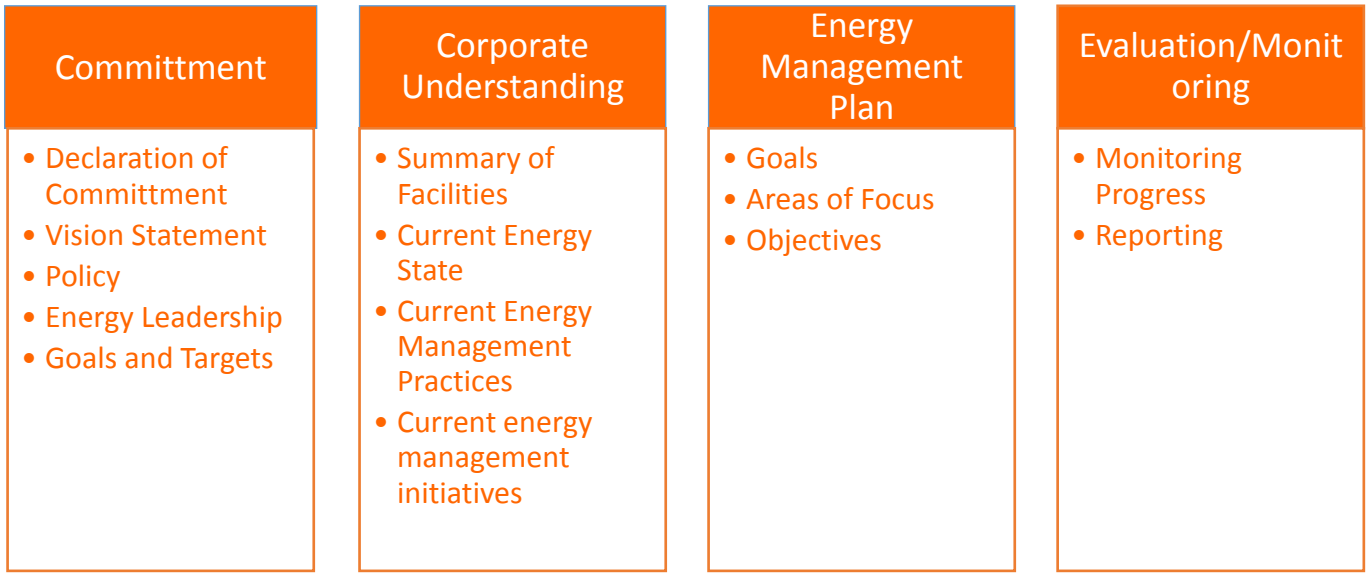


Figure 1: Detailed approach of the development and implementation of the Town of Pelham's CDM plan.

Corporate Commitment

Declaration of Commitment

The Town of Pelham is dedicated to conserve energy and reduce the environmental impacts that contribute to climate change by committing to the following:

- Allocation of resources necessary to develop an energy reduction plan and reduce greenhouse gas emissions (i.e. Energy Audits, Carbon Audits, Facility Condition Reports)
- Promotion of responsible energy management by economically viable energy conservation projects
- Compliance with legislated environmental requirements and standards
- Meeting the needs of the present energy demands without compromising the ability of future generations to meet their needs

Vision Statement

To incorporate energy management and conservation into all Town activities through proactively pursuing strategic energy management solutions that will enhance delivery of services and contribute to environmental, social and economic well being of the community.

Policy

The energy management plan shall pertain to all Town facilities and operations that are owned or leased and billed accordingly to the Town of Pelham. This will include procurement practices, financial management, investment decisions, facility capital, and operations and maintenance.

Energy Management and Leadership

Top management has made an endless commitment to allocate manpower and funds to achieving continuous improvement in energy management and greenhouse gas emissions. All Town staff share the responsibility of strategic energy management as activities occur across various departments and buildings. The Town has an internal Green Team Committee, where members are responsible for identifying effective and efficient initiatives to reduce the Town's ecological footprint.

The Town of Pelham has also created a Utility Sustainability Advisory Committee, where the committee will review all Town owned and operated facilities with the goal of reducing operational costs in respect to utility consumption and utility billing rates.

- Energy Leader → The Chief Administrative Officer (CAO) is the designated energy leader with overall responsibility for corporate energy management planning. The leader ensures compliance regulations are met and remains to work closely with council to make required changes.
- Energy Team → Staff members from departments who carry out significant responsibility for energy performance or who can provide essential input to energy management process. The Green Team and Utility Sustainability Advisory Committee are two vital teams that contribute to sustainability in Town facilities.
- Energy Training → Communication strategy to educate all employees in conservation and efficiency opportunities associated with specific job functions

Goals in Energy Management

1. Reduce environmental impact of Town operations through utilizing best practices
2. Continuously improve energy efficiency of facilities and processes in order to reduce operating costs, reduce energy consumption (intensity) and resulting greenhouse gases
3. Reduce impact of new Federal Tax on Greenhouse Gas Pollution
4. Create culture of conservation
5. Provide guidance and leadership for the adoption of a culture of sustainability

Overall Target

The ***absolute* target** for Town of Pelham's energy conservation and demand management plan will be to reduce consumption of natural gas, electricity and greenhouse gas emissions by an **average of 2% per year** between now and 2022 (4-year period).

Corporate Understanding

Summary of Facilities

The reporting of energy consumption and greenhouse gas emissions is required for all facilities that the Town of Pelham is issued the invoices and is responsible for making payments towards. A full list of facility categorization is provided in **Appendix B**. It contains reference to all Town owned or leased facilities that are provided utilities and wastewater treatment through municipal services. The important components required under regulation include the specific address, total floor space (square feet) the hours of operation per week, noteworthy capital projects and notes and energy consumption data.

All current energy management and conservation measures discussed throughout this report pertain only to the facilities and operations depicted in **Appendix B**. Each department of facilities will be analyzed for current energy state and greenhouse gas emissions in the current energy state section.

Current Energy State

An overview of the current state and distribution of energy use was implemented in order to formulate a unique energy management plan (**Appendix C**). Gathering this information helps to determine which facilities are the largest consumers of energy and largest emitters of greenhouse gases. It allows for specific objectives to be made in energy conservation that focus primarily on improving the efficiency of its largest consumers and emitters. In recent years, the facilities within the Town of Pelham have been analyzed to consume more natural gas energy than electricity (**Figure 2**), and as shown in **Figure 3**, it has been consistent for every year since 2014 except for 2016.

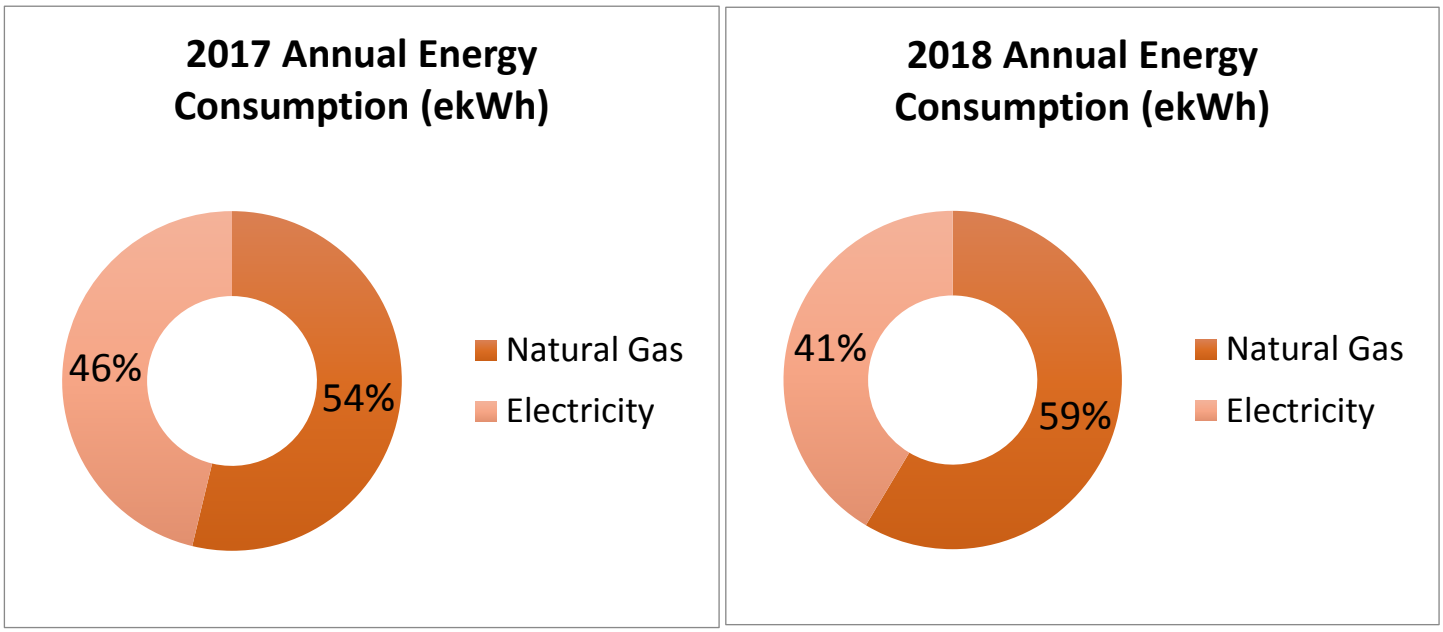


Figure 2: Comparing Annual Energy Consumption of Natural Gas and Electricity Consumption

As shown in **Figure 2** it is evident that the Town of Pelham facilities have a higher demand for natural gas than electricity consumption in recent years. Therefore, considerations should be made based on this statistic for future energy conservation efforts to focus on decreasing natural gas consumption where possible. The upcoming sections on energy reporting will outline annual energy consumption and greenhouse gas emission from 2014-2018 for all Town owned or leased facilities.

Summary of Annual Energy Consumption, Greenhouse Gas Emissions and Cost

The annual energy consumption from all Town facilities was calculated using the utility bills provided via the Town of Pelham (**Appendix C**). The annual greenhouse gas emissions were calculated using emission factors (EF) and global warming potentials (GWP) provided via the Canada National Inventory Report (NRI) (**Appendix A**). As shown in **Table 1**, the analysis demonstrates that energy consumption and greenhouse gas emissions have decreased by greater than the ***1.5%*** average per year, until the Meridian Centre Community Centre was built in 2018. Aside this project, this demonstrates improved energy management since the publishing of the first energy conservation plan, though changing regulatory requirements will require that relevant factors from the current years results be taken into consideration for the development of a new conservation plan. **Table 2** exhibits the estimated cost for the provision of energy from 2014-2018 and **Figures 3** and **4** display the trends in consumption, emissions and cost over the last 4-years.

Table 1: Summary of Town of Pelham Facilities Annual Energy Consumption and Emissions

Year	Electricity (kWh)	Natural Gas (m^3)	GHG Emissions ($kgCO_2e$/year)
2014	1,133,271.00	186,519.00	399,596.64
2015	1,232,606.96	151,829.00	337,681.45
2016	1,434,334.00	135,877.00	315,452.02
2017	2,270,455.00	143,314.00	361,529.00
2018	4,010,917.00	314,547.00	754,596.00

Table 2: Summary of Town of Pelham Facilities Annual Energy Costs

Year	Estimated Annual Electricity Cost ($)	Estimated Annual Natural Gas Cost ($)	Estimated Annual Total Energy Cost ($)
2014	$ 155,824.76	$ 93,259.50	$ 249,084.26
2015	$ 207,077.97	$ 50,103.57	$ 257,181.54
2016	$ 258,180.12	$ 44,423.46	$ 302,603.58
2017	$ 210,213.92	$ 69,463.96	$ 279,677.88
2018	$ 523,585.76	$ 92,903.01	$ 616,488.77

Annual Energy Consumption and GHG Gas Emissions from 2014-2018

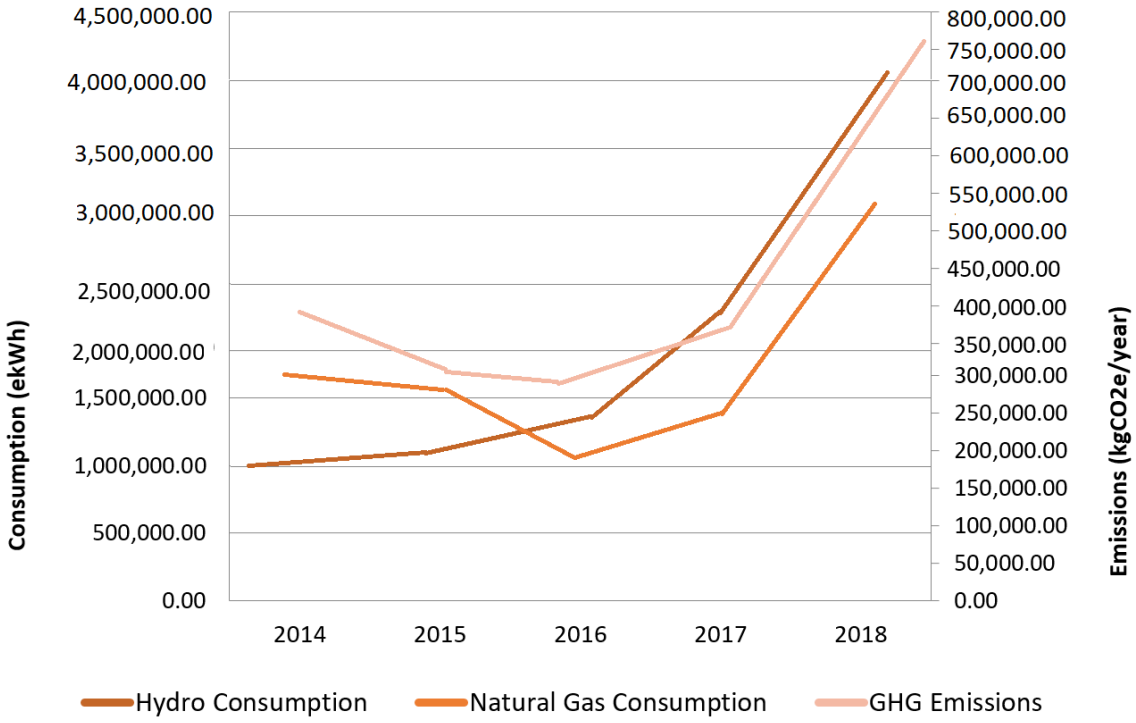


Figure 3: Annual Natural Gas and Electricity Energy Consumption from 2014-2018

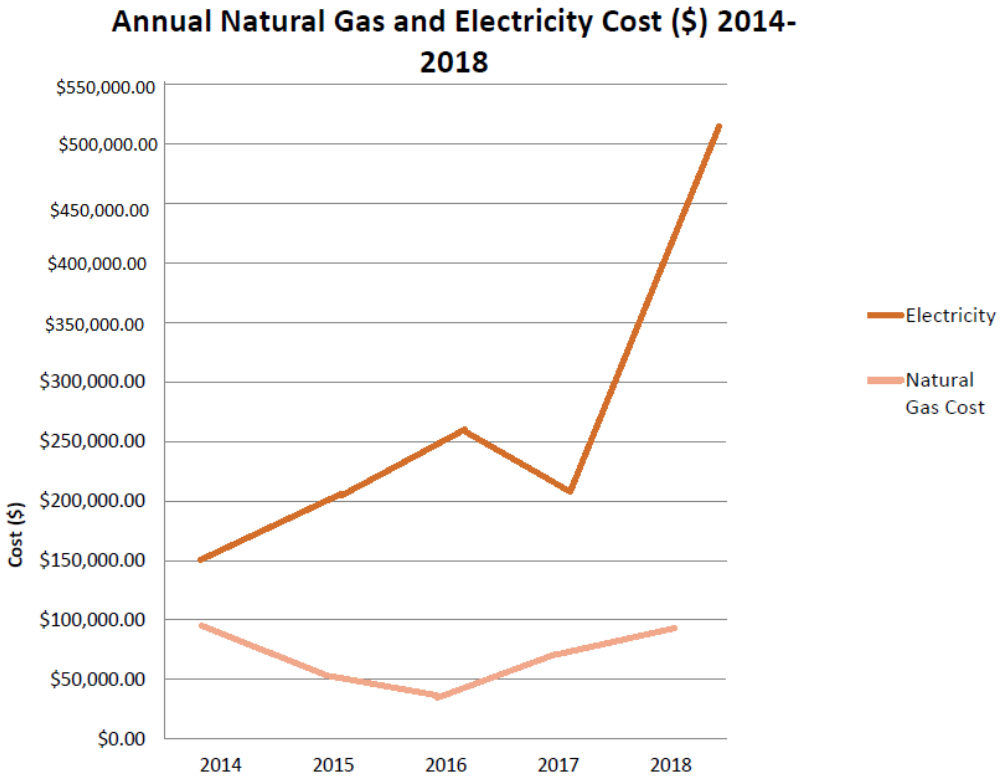


Figure 4: Annual Natural Gas and Electricity Cost from 2014-2018

To establish which of the facilities contributed largest to the consumption of energy and greenhouse gas emissions in recent years, an analysis of the facilities by departments was done for this report. As mentioned previously, a full list of the facilities to supplement this data is provided in **Appendix B**.

Based on the analysis; it is evident that the *Parks and Recreation* and *Public Works* departments are the largest consumers of electricity in the Town of Pelham. The largest consumers of natural gas by department are *Parks and Recreation*, *Fire Departments* and *Public Works*. Therefore, making conservation efforts and initiatives for these departments more significant in comparison to others.

It is important to note for this analysis that although the *Parks and Recreation* department was the largest consumer of both electricity and natural gas in 2018, it can be attributed to a number of overarching factors. These factors can include, but are not limited to the list provided in **Table 3**.

Table 3: Influencing Factors for Energy Consumption Demands

Operation/Facility	Address	Influencing Factor
Pelham Arena	1120 Haist Street	Facility has ceased operations in *2017*; provision of natural gas and electricity still exists in 2018.
Peace Park	20 Pelham Town Square	Provision of special events power supply in *2015* for Farmers Markets, Summer Festivals and Summer Concerts
Centennial Park	999 Church Street	Provision of electrical services and lighting upgrades in *2016*
Harold Black Park	954 Haist Street	Provision of electrical services and lighting upgrades in *2016*

Also, the new Meridian Community Centre that began operating mid year of 2018. It is important to recognize though that the data may be inconsistent as it does not resemble the average monthly usage for a facility of that size and capacity. As such, a more complete understanding of the impact from this facility on the *Parks and Recreation* department and overall energy consumption data will need to be obtained for the 2019 year.

Current Energy Management

The management of the Town's energy consumption is divided into three categories: energy supply management, energy data management and energy use management.

Energy Supply Management

The following service providers (**Table 4**) are optimized for the provision of energy within Town boundaries in the Municipality of Pelham:

Table 4: Utilities Service Providers for the Town of Pelham

Supplier	Type of Energy
Enbridge Gas	Natural Gas
Just Energy	Natural Gas
Niagara Peninsula Energy	Electricity
Hydro One	Electricity

Energy Data Management

Energy data is currently managed through the *Corporate Services* and *Public Works Departments* at the Town of Pelham. Natural gas and electricity bills for the facilities are sent initially to the *Public Works Department* for documentation purposes and then are forwarded to the clerk at *Corporate Services* for payment. The bills are stored as PDF files in the Town of Pelham's database and are easily accessible when required to undergo potential energy audits, carbon audits, or facility assessment reports.

Energy Use Management

Managing of energy consumption and evaluation of energy performance for all Town owned and leased facilities are currently undergone by the *Corporate Services Department* and the *Public Works Department.* Specifically, James Allen and his counterparts in the public works department have specific information on operations and maintenance of Town of Pelham facilities.

Energy Initiatives

Since the release of its first Energy Conservation and Demand Management Plan in 2014, the Town of Pelham has proactively evaluated energy conservation projects to improve efficiency of their facilities. **Table 5** shows the projects that were carried out from 2015-2018 at specified facilities, with some already providing energy savings and others requiring additional months of energy data. The general trend of completed and ongoing projects focus on improvement of electrical equipment inefficiencies and reducing the amount of heating/cooling lost to poor internal and external insulation materials.

Table 5: Completed and Ongoing Energy Initiatives for Town of Pelham Facilities

Project Name	Location of Project	Year	Estimated Cost ($)
Energy Efficient Lighting Controls (e.g. lighting dimmer, motion sensor switches)	Municipal Building	2015	$4,500
New Condensing Unit (HVAC system)	Fonthill Library	2015	$5,000

West Entrance Roof Repairs	Municipal Building	2015	$5,000
Energy Efficient Lighting Controls (e.g. lighting dimmer, motion sensors)	Fire Hall #1	2016	$3,500
Renovation of staff washroom/change-room	Tice Road Operations Centre	2016	$10,000
Concession Building Electrical Service and Lighting Upgrade	Centennial Park	2016	$13,500
	Harold Black Park		$13,500
Partial Roof Replacement	Municipal Building	2017	$44,000
Partial Roof Upgrades	Municipal Building	2017	$33,000
Upgraded lighting controls	Fire Station #2	2018	$3,500
Exterior Lighting Replacement	Fonthill Library	2018	$5,000
Upgraded Lighting Controls and Panel Replacement			$8,500
Replaced Lighting Panels and Installation of Lighting Controls	Tice Road Operations Centre	2018	$17,000
Washroom Renovations and New Hot Water Tank	Harold Black Park	2018	$47,000
Upgraded power distribution and main disconnect	Park Lane Operations Centre	2019	$25,000

Renewable Energy

Defined as a source of energy generated from natural resources such as sunlight, wind, water, biomass and geothermal heat. These resources are infinite in nature and can meet certain energy requirements without compromising the ability of future generations to thrive. Construction of specific infrastructure is a necessary component to be able to retrieve and use energy generated from renewable sources.

Currently, no renewable energy systems are contributing to the power grid within the Town of Pelham. Researching the economic, environmental and social feasibility of implementing and developing such technology for specific city run facilities will be explored and presented to the *Public Works* Facility Department. Overall, the target will be to establish a foundation for the future of renewables and to initiate projects for consideration, such as:

- Ground mount solar, solar wall, procurement of renewable energy certificates (RECs) and geothermal systems
- Installation of a solar wall to provide Community Centre pool with solar heated fresh air – essentially leading to reductions in the amount of natural gas required to heat the pool
- Use of biomass from organic landfill waste to source renewable biogas energy

Energy Management – The Plan

The Energy Conservation Plan and its initiatives are provided in **Appendix D** of the report. The upcoming sections will serve as the descriptive component for each subheading chosen in the chart.

Goals

The energy conservation goals for the Town of Pelham are strongly based on meeting the needs of the present energy demands without compromising the ability of future generations to meet their needs. The primary conservation goals will be consistent with the Town of Pelham Strategic Plan and will broadly focus on initiatives that provoke the following outcomes:

1. Reductions in energy consumption and greenhouse gas emissions
2. Continuous improvement in energy efficient equipment installations
3. Utilization and assessment of renewable energy projects
4. Establishment of educational programs in energy demand to help promote behavioural changes

Focus Area

The selection of energy conservation actions for the Town of Pelham, considered specific facilities and departments as priority areas that require the most immediate attention (**Appendix D**). Previous sections on current energy state and management, and results from **Appendix C** were used to select priority areas. It was determined that the *Parks and Recreation* and *Public Works* are the priority areas that the Town of Pelham should focus its energy conservation efforts on due their statuses are largest energy consumers and greenhouse gas emitters.

Strategies

In order to achieve utility cost reductions and reductions in greenhouse gas emissions from the specific focus areas mentioned above. The Town of Pelham will require the provision of these 4 strategies when selecting actions to help achieved the desired goal.

- Technological Changes: Relates to building systems such as lighting, heating and ventilation
- Organizational Changes: Relates to instituting new practices that facilitate the achievement of cost reduction and consumption reduction targets
- Behavioural Changes: Driven by promoting awareness, education, and training of all faculty and community members

Objectives/Actions

The selected objectives and courses of action for energy conservation were based on the ability to meet the required goals listed above, being financially feasible and relevant to the operations of the facility. As is shown in **Appendix C**, multiple courses of action can be optimized per each goal to obtain the desired outcome of reducing energy usage and greenhouse gas emissions.

Estimated Cost

The estimated costs and savings from the implementation of energy conservation actions and objectives in **Appendix C** are representative of quotes from **Insyght** facility and energy audit reports and previous Town expenditures from the Capital Asset Management Plan 2015-2019.

Evaluation

Monitoring Progress

The implementation of the energy demand and management plan for the Town of Pelham will effectively provide a reference point for all stakeholders to learn about energy initiatives and practices the Town of Pelham has instituted. In addition to providing a publicly available document that abides to all the requirements of *Ontario Regulation 507/18*.

As part of this plan, the Town of Pelham shall continuously monitor all the energy systems and initiatives taking place to help preserve energy and reduce greenhouse gas emissions from its facilities and operations. The commitment to the plan shall contribute to all decision making for future development and growth, and be adjusted accordingly based on economic, environmental and social factors.

Reporting

The development of annual reports that take into consideration environmental and energy demand changes will be a regulatory requirement for the Town of Pelham. The reporting will require updated regulatory requirements and goals and objectives that meet the relevant stakeholder requirements.

Due to the consistent changes in legislation every election, it would be crucially recommended that Town of Pelham council maintain a keen eye on grants and other funding opportunities as they arise. The overarching goal for Pelham is to receive the appropriate allocation of funds to help promote sustainable energy practices without having to tie themselves down to large capital costs.

Appendix A: Emissions Factors and Global Warming Potential Calculations

Emissions Factors (EF)		
Type	**Value**	**Source**
Carbon Dioxide (CO2)	1888	Canada National Inventory Report: Part 2, Table A6-1
Methane (CH4)	0.037	Canada National Inventory Report: Part 2, Table A6-2
Nitrous Oxide (N2O)	0.035	Canada National Inventory Report: Part 2, Table A6-2
Electricity (Consumed)	40	National Inventory Report: Part 3, Table 13-7

Global Warming Potential (GWP)		
Type	**Value**	**Source**
Carbon Dioxide (CO2)	1	Canada National Inventory Report: Part 1, Table 1-1
Methane (CH4)	25	Canada National Inventory Report: Part 1, Table 1-1
Nitrous Oxide (N2O)	298	Canada National Inventory Report: Part 1, Table 1-1

Equation for Calculating Greenhouse Gas Emissions (kgCO2e/m3) for Natural Gas:

*[Natural gas consumption (m3) * CO2 EF * CO2 GWP] + [natural gas consumption (m3) * CH4 EF * CH4 GWP] + [natural gas consumption (m3) * N2O EF * N2O GWP] / 1000*

Equation for Calculating Greenhouse Gas Emissions (kgCO2e/kWh) for Electricity Consumed

*[Electricity consumption * EF]*

Appendix B:

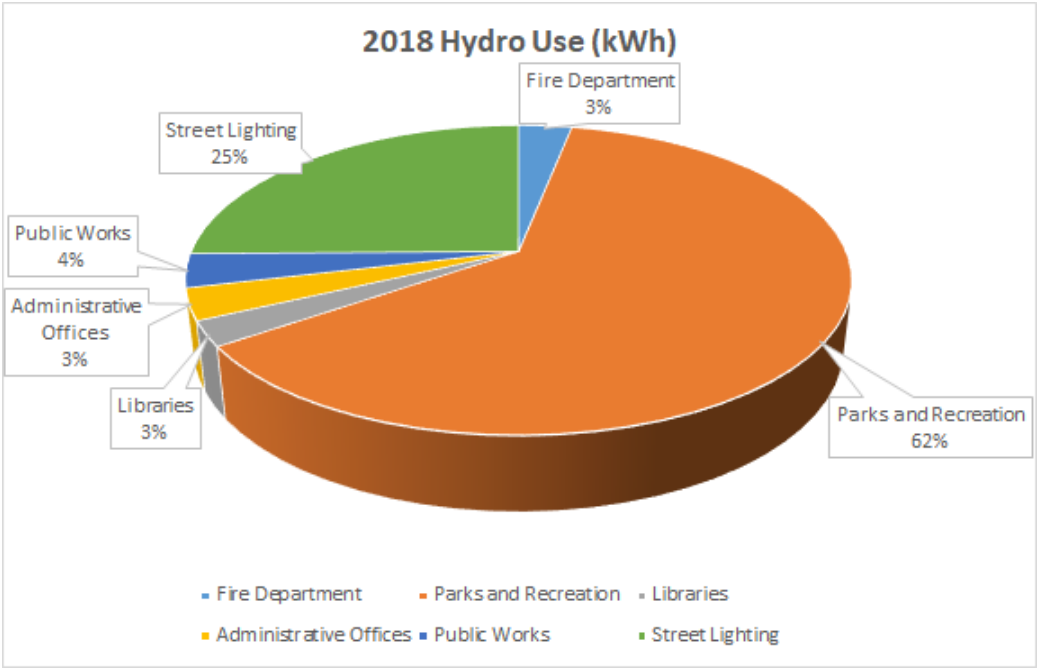
Faculty Category Lists

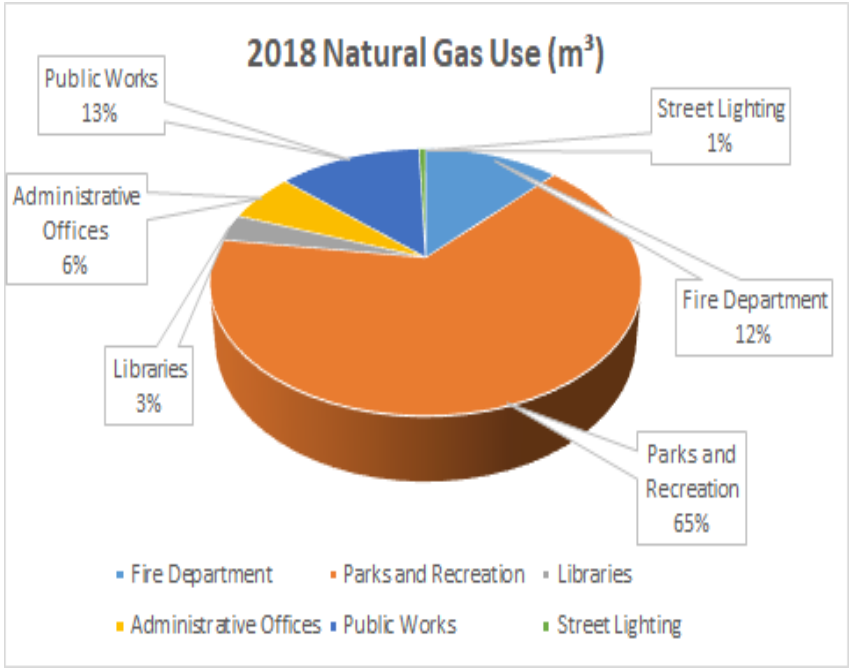
Department	Facilities/Operations	Address	Total Floor Space (ft^2)	Hours of Operation	Noteworthy Projects/Changes in 4-year period
Fire Department	Fire Station #1	177 Highway 20 West	10,858.62	40	***2016:*** Energy efficient lighting controls ***2018****:* Fire Station #1 – 1500+ square foot renovation
	Fire Station #2	792 Welland Road	13,837.55	16	***2018:*** Upgraded lighting controls
	Fire Station #3*	2355 Cream Street	7,000.00	16	***2014***: New facility*
	Kiosk Behind Fire Station #2	792 Welland Road	N/A	N/A	***2016****:* New Kiosk with incomplete information on floor space and average hours/week
Parks and Recreation	Centennial Park	999 Church Street	2,492	20	***2016***: Electrical service and lighting upgrade for CP concession building
	Harold Black Park	954 Haist Street	2,828	20	***2016*****:** Electrical service and lighting upgrade for HBP concession building ***2018*****:** Washroom renovations and new hot water tank
	Marlene Stewart Streit Park	55 Park Lane	2,168	70	N/A
	Peace Park	20 Pelham Town Square	652.87	4	***2015***: Special events power supply for Summer Festival, Farmers Markets & Concerts
	Pelham Arena	1120 Haist Street	30,608.1	0	***2017***: Discontinued; provision of utilities remains

	Meridian Community Centre	100 Meridian Way	143,000	119	***Sept 2018*:** Meridian Community Centre complete under *LEED* guidance
Libraries	Fonthill Public Library	25 Highland Avenue	3,530.00	56.5	***2015:*** New condensing unit
	Maple Acres Public Library	781 Canboro Road	5,367.00	28	***2016:*** $1 million renovation increased floor space to from 1,967 to 5,367
Administrative Offices	Municipal Offices	20 Pelham Town Square	11,150.65	40	***2015:*** Installation of energy efficient lighting controls and repair of roof leak at west entrance ***2017:*** Partial roof replacement
	Old Pelham Town Hall	491 Canboro Road	4,875.00	25	N/A
Public Works	Fonthill Cemetery	25 Highland Avenue	3,530	8	*Cemetery used for storage of town owned equipment
	Park Lane Water Building	33 Park Lane	4,063.00	40	*Only parts of Park Lane Water Building are insulated – workshop located in building ***2019***: Upgraded power distribution and main disconnect
	Tice Road Operations Centre	675 Tice Road	10,573.35	40	***2015*:** Electric door operators installed ***2016*:** Renovation of staff washroom/change-room ***2018*:** Replacement of Light panels and lighting controls; new air exchange unit; replacement of main door and bay doors

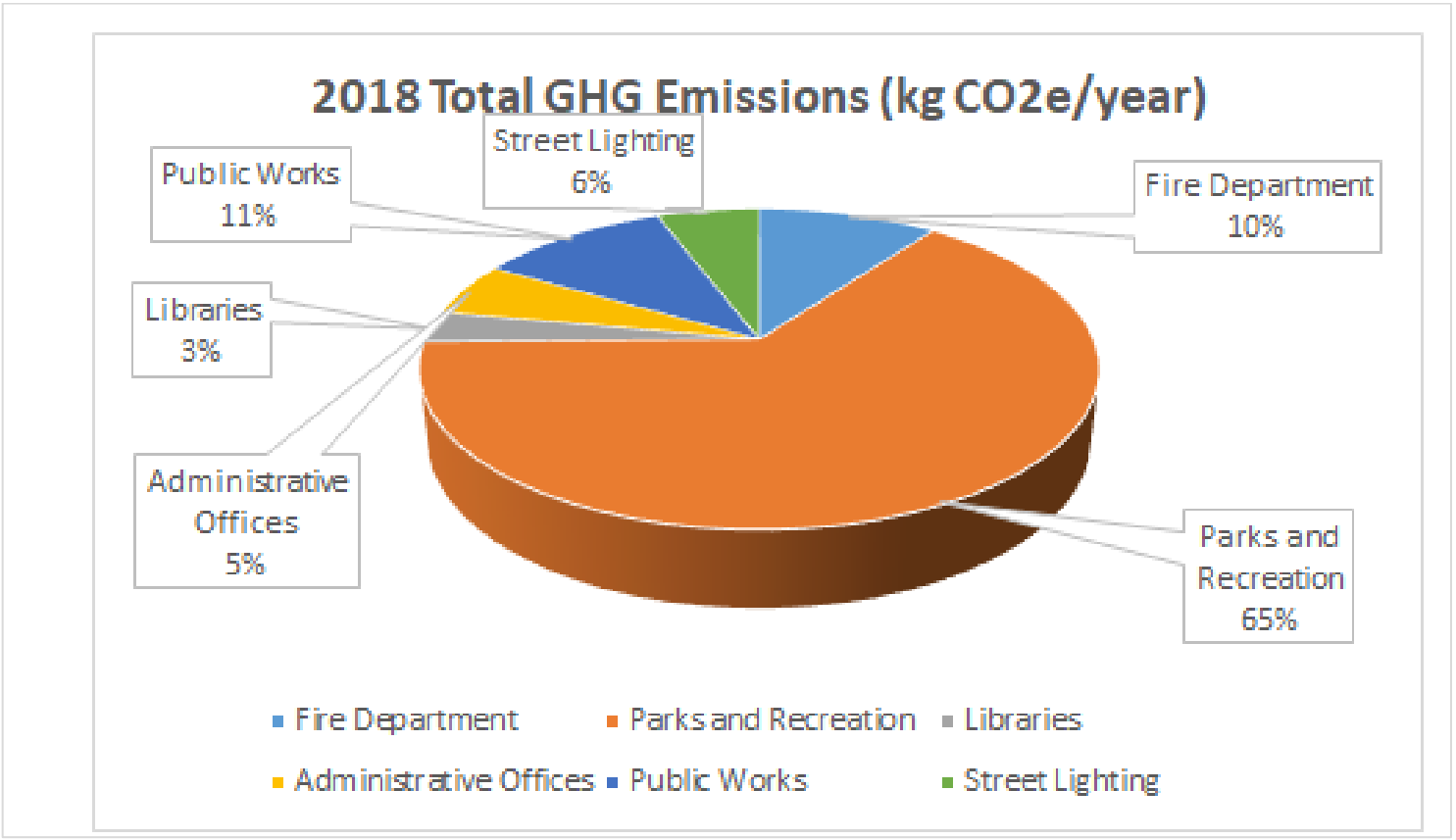
Appendix C:

Hydro and Natural Gas Consumption and Greenhouse Gas Emissions Data





Department	Hydro Consumption (kWh)	Department	Natural Gas Consumption (m3)
Fire Departments	123,466.00	Fire Departments	37,963.00
Parks and Recreation	2,498,000.00	Parks and Recreation	204,985.00
Libraries	104,503.00	Libraries	110,426.00
Administrative Buildings	131,548.00	Administrative Buildings	18,971.00
Public Works	142,039.00	Public Works	40,363.00
Street Lighting	1,011,360.00	Street Lighting	1,839.00
TOTAL:	**4,010,916.00**	**TOTAL:**	**414,547.00**



Department	Greenhouse Gas Emissions (kg CO2e/year)
Fire Departments	76,648
Parks and Recreation	487, 123
Libraries	23, 874
Administrative Buildings	41,097
Public Works	81, 925
Street Lighting	43, 928
TOTAL:	**754,596**

Appendix D:

Outline of Strategies, Actions, Costs and Energy Savings from Implementing Conservation Related Initiatives

Focus Area	Facility	Type of Strategy	Action	Estimated Cost	Estimated Savings	Energy Reduction
Parks and Recreation	Marlene Stewart Streit Park	Technological	- Installing a new hot water tank in pool building	**$10,000.00**	**$24.63/year**	**10-15%**
			- Retrofitting indoor light fixtures from T-12 to T-8 and T-5 LED tubes	**$4,500.00**	**$82.43/year**	**15-20%**
			- Retrofitting exterior light fixtures to LED bulbs	**$1,000.00**	**$104.83/year**	**40-50%**
			- Installing lighting controls (e.g. occupancy sensors, timers)	**$3,000.00**	**$312.03/year**	**30-60%**
		Organizational	- Instituting operational level programs such as peak shaving plan and maximization of warranties from manufacturers	**N/A**	**$184.08/year**	**3-5%**
		Behavioural	-Educating and training staff to unplug unused devices to decrease phantom load and setting lower room temperatures	**N/A**	**$40.00/year**	**1-2%**
	Peace Park *(No facility on*	Behavioural	- Educating and training staff and the community to	**N/A**	**$20.00/year**	**1-2%**

Parks and Recreation	*site)*		decrease phantom loads during Summer Festivals, Concerts and Farmers markets - Working with events staff to promote energy sustainability into the operations			
	Centennial Park	Technological	- Installing a new hot water tank in pool building	**$1,500.00**	**$17.81/year**	**10-12%**
			- Retrofitting exterior light fixtures to LED bulbs	**$3,000.00**	**$104.83/year**	**40-50%**
		Behavioural	- Educating and training staff to unplug unused devices to decrease phantom load and setting lower room temperatures	**N/A**	**$18.00/year**	**1-2%**
Public Works	Fonthill Cemetery	Technological	- Retrofitting interior lighting from T-12 to T-5 fixtures	**$1,000.00**	**$21.30/year**	**18-20%**
			- Retrofitting exterior lighting to LED bulbs	**$1,000.00**	**$78.62/year**	**40-50%**
			- Installing programmable thermostat	**$1,000.00**	**$29.77/year**	**30-60%**
		Organizational	- Instituting operational level programs such as peak shaving plan and maximization of warranties from manufacturers	**N/A**	**$40.00/year**	**3-5%**
	Park Lane Water	Technological	- Installing a new hot water	**1,000.00**	**$22.84/year**	**10-15%**

Public Works	Building		tank in pool building			
		Technological	- Retrofitting interior lighting from T-12 to T-5 fixtures	**$5,000.00**	**$91.05/year**	**15-20%**
			- Retrofitting exterior lighting to LED bulbs	**$2,000.00**	**$78.62/year**	**40-50%**
	Park Lane Water Building		- Replacing existing cladding and cladding walls with 3-inch rigid insulation and other building envelope improvements	**$23,000.00**	**$205.38/year**	**60-80%**
			- Replacing single glazed windows with double glazed windows and other building envelope improvement	**$10,000.00**	**$6.55/year**	**15-20%**
		Organizational	- Instituting operational level programs such as peak shaving plan and maximization of warranties from manufacturers	**N/A**	**$114.00/year**	**3-5%**
		Behavioural	- Educating and training staff to unplug unused devices to decrease phantom load and setting lower room temperatures	**N/A**	**$22.84/year**	**1-2%**
	Tice Road Operations Centre	Technological	- Installing a new hot water tank in pool building	**$1,500.00**	**$38.40/year**	**10-15%**
			- Replacing single glazed	**$4,000**	**$6.23/year**	**15-20%**

Public Works	Tice Road Operations Centre		windows with double glazed windows			
			- Replacing existing cladding and cladding walls with 3-inch rigid insulation and other building envelope improvements	**$47,000.00**	**$455.73/year**	**60-80%**
		Organizational	- Instituting operational level programs such as peak shaving plan and maximization of warranties from manufacturers	**N/A**	**$324.54/year**	**3-5%**
		Behavioural	- Educating and training staff to unplug unused devices to decrease phantom load and setting lower room temperatures	**N/A**	**$65.00/year**	**1-2%**