



The Corporation of Norfolk County
Energy Conservation and
Demand Management
Plan

July 2019 to July 2024

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1.0 Norfolk County Energy Profile

1.1 Norfolk County Profile

Norfolk County is located on the north shore of Lake Erie, in the heart of Southwestern Ontario. Located between Elgin and Haldimand Counties, Norfolk County is comprised of several small communities spread across 1,607 square kilometers. It forms the heart of Canada's Carolinian Forest zone, and surrounds the Long Point UNESCO World Biosphere Reserve. In 2010, Norfolk County partnered with Brant and Haldimand Counties, Brantford, and the Six Nations of the Grand River First Nation to form Ontario's first "Green Energy Hub" alliance.

Norfolk County is presently home to multiple large commercial solar farm projects and numerous private small ground-mount or rooftop solar projects. While the County has declared itself an unwilling host for any new, large-scale wind turbine projects for electricity generation, the County is host to a significant number of wind turbines. The first commercial "Archimedes screw" micro-hydro generating project in Ontario was commissioned within Norfolk County. Further, in 2015 Norfolk County was one of the first Ontario municipalities to generate energy from non-recyclable solid waste through the Emerald Energy From Waste facility.

1.2 Norfolk County Key Energy Statistics

Norfolk County Geographical Area = 1,607 square kilometers

Population= 64,044 (2016 Census)

Norfolk County-Owned Woodlot Area = 2,385 acres

Carbon sequestration of County woodlots = 5,562.5 tonnes of CO₂ / year

Installed Renewable Energy Generation Capacity throughout Norfolk County (2018 Estimate) = 132,547.2 kW

Annual Renewable Energy Generation throughout Norfolk County (2018 Estimate) = 268,644,239 kWh

Installed Public Electric Vehicle Charging Stations = 6

2.0 Norfolk County in 2024: An Energy Vision

The 2019-2024 Norfolk County Energy Conservation and Demand Management Plan (ECDM) has been developed to address the fiscal, societal, and environmental risks associated with the consumption of energy by the Corporation of Norfolk County. It has been designed to provide a guiding light for the future of the energy management program within The Corporation of Norfolk County. The ambitious goals, objectives and expected follow through shall further validate Norfolk County's reputation as being an environmentally and fiscally responsible municipality.

The 2019-2024 Norfolk County Energy Conservation and Demand Management Plan has been developed in accordance with Ontario Regulation 507/18 under the Electricity Act. The Plan was endorsed by Norfolk County Council on May 21st, 2019. In addition, Norfolk County's Senior Leadership Team reviewed and supported the Plan on April 25th, 2019.

2.1 Vision Statement

To improve the energy efficiency of municipal services within Norfolk County, provide local leadership in sustainability and enhance the quality of life of all who live, work and play in Norfolk County.

2.2 2019-2024 Goals and Objectives

To achieve the 2024 energy vision for Norfolk County, the following five strategic goals and specific objectives have been established.

2.2.1 Reduce GHG Emissions of County Operations in accordance with the United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement targets

2.2.1.1 Goal

Demonstrate leadership by committing The Corporation of Norfolk County to meet Canada's targets to the United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement by reducing GHG emissions by 30% below 2005 levels by 2030.

2.2.1.1 Objectives

- a) Reduce the total annual GHG emissions from County operations by 25% below 2005 levels by 2024.
- b) Reduce the annual GHG emissions from County facilities by 5% below 2018 levels by 2024.

- c) Commit The Corporation of Norfolk County to meeting Canada's targets to the United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement by reducing GHG emissions by 30% below 2005 levels by 2030.
- d) Commit The Corporation of Norfolk County to becoming a carbon neutral organization by 2030.

2.2.2 Increase Energy Efficiency of County Operations

2.2.2.1 Goal

Reduce the total annual weather-corrected energy consumption intensity of County facilities below 2018 levels by 2024.

2.2.2.1 Objectives

- e) Reduce total energy consumption in 80% of Norfolk County facilities below 2018 levels by 2024.
- f) Reduce the total annual weather-corrected energy consumption intensity (kBTU/ft²) of all non-water/wastewater facilities by 10% below 2018 levels by 2024.
- g) Reduce street light energy intensity of remaining 800 non-LED street lights by 50% below 2018 levels by 2024.
- h) Reduce the total annual weather-corrected energy consumption intensity (kBTU /m³) of water/wastewater facilities by 5% below 2018 levels by 2024.

2.2.3 Reduce Annual Energy Costs of County Operations

2.2.3.1 Goal

Reduce the total annual energy costs of County operations.

2.2.3.1 Objectives

- a) Despite expected electricity rate increases, reduce total electricity cost intensity of all non-water/wastewater facilities by 5% below 2018 levels by 2024.
- b) Despite expected natural gas rate increases, hold total natural gas cost intensity of all County facilities to a maximum 10% increase over 2018 levels.
- c) Despite expected fuel rate increases, hold total fuel costs to a maximum 5% increase over 2018 levels.
- d) Explore alternative, cost-effective, sources of energy with the aim to meet the above objectives.

2.2.4 Promote Commitment to a Sustainable Norfolk County

2.2.4.1 Goal

Promote sustainability and advocate for the responsible and efficient use of energy and resources within Norfolk County.

2.2.4.1 Objectives

- a) Establish and implement a Norfolk County Climate Change Adaptation and GHG Emissions Reduction Plan to promote long term sustainability of Norfolk County
- b) Enhance corporate procurement strategies to place a stronger emphasis on long-term sustainability, life-cycle costing and energy efficiency. Explore potential of inclusion of “upstream” energy and GHG emissions in procurement.
- c) Enhance existing staff energy awareness program and expand the program to promote energy efficiency to residents and businesses County-wide
- d) Integrate energy conservation, asset management, and climate change adaptation and GHG emissions planning to provide long-term sustainability guidance to the Corporation
- e) Increase the visibility of energy and sustainability considerations to Council, senior leadership team, County staff and general public
- f) Annually report the progress made to the goals and objectives outlined in Plan to Council
- g) Explore alternative methods to increasing the long-term sustainability of the Corporation and the community

2.2.5 Expand Renewable and Sustainable Energy Generation

2.2.5.1 Goal

Promote energy sustainability through increasing the generation of renewable energy through County facilities.

2.2.5.1 Objectives

- a) Generate 10% of the County’s total electricity consumption through renewable energy sources by 2024.
- b) Reduce the energy consumption of five Norfolk County facilities by at least 30% through a combination of energy efficiency measures and on-site renewable energy generation.
- c) Commission (or final design) of a “net zero” County facility

3.0 Norfolk County Energy Baseline

To achieve the 2024 energy vision for Norfolk County, it is imperative that the current state be thoroughly defined and a strong baseline established to ensure that future actions can be measured and evaluated.

3.1 Summary of Norfolk County Energy Assets

The Corporation of Norfolk County is responsible for the energy consumption of: 157 properties (detailed listing and 2018 energy consumption can be found in Appendix A), 229 fleet & motorized equipment, 4,946 street lights and 30 intersections with LED traffic lights. Properties are powered by grid electricity and natural gas, fleet and motorized equipment are powered by gasoline and diesel, street and traffic lights are mainly powered through grid electricity, with select traffic lights being solar powered.

Norfolk County Properties Overview

Property Category	Number of Properties	Total Gross Building Area (ft ²)
Administration	8	126,468
Public Libraries	4	47,026
Cultural Facilities- Recreational Facilities	42	358,604
Cultural Facilities- Community Centres	15	115,363
Cultural Facilities- Museums and Associated Facilities	8	60,019
Cultural Facilities- Medical Centres	2	13,694
EMS Bases and Associated Facilities	7	20,035
Fire Stations and Associated Facilities	12	83,463
Roads Operations & Storage Facilities	14	92,486
Long Term Care Facilities	1	123,845
Water / Wastewater Facilities	50	187,150
Solid Waste Transfer Stations	2	850

*1 Properties with multiple categories are included in all categories.

Norfolk County Fleet and Equipment Overview

Fleet Category	Number of Vehicles
Medium-Duty Trucks/Vans	82
Heavy-Duty Trucks/Vans	36
Fire Vehicles	61
EMS Vehicles	18
Large Motorized Equipment	26
Ice Resurfacers	6

Norfolk County Renewable Energy Generation Overview

Renewable Energy Generation Category	Number of Installations	Size
Rooftop Solar	1	10 kW
Micro-hydro	0 [project recently halted through repeal of Green Energy Act]	60 kW

3.2 Norfolk's Current Corporate Energy Approach

Norfolk County has implemented a de-centralized approach to managing energy and relies on energy awareness and shared responsibility from all staff. Norfolk County currently has dedicated 0.5 of a FTE (full-time equivalent), located in the Facilities Department of the Public Works Division to be responsible for overseeing the energy management program including: implementing an energy awareness program, energy data management, energy procurement and energy retrofits.

3.2.1 County Energy Awareness Program

Corporate-wide energy awareness was first initiated in Norfolk County when the Energy Conservation Committee (formerly the Energy Conservation Project Team) was formed in May 2003. After the hiring of an Energy Coordinator, a formal staff energy awareness program was established in late 2013 and has evolved into the current program.

3.2.1.1 Staff Energy Conservation Competitions

The Corporation of Norfolk County periodically holds energy competitions, where County staff are challenged to reduce the energy consumption of their facilities or develop innovative ideas to reduce energy consumption in their workplace. Eleven competitions have been held since 2014 and have generated over 484,007 ekWh (or \$37,123 in avoided costs) in directly measureable energy savings.

3.2.1.2 Energy Promotions

Energy efficiency is promoted within the County through various communication channels. Energy newsletters are issued to all County staff and include consumption performance updates, conservation tips and energy project updates. In addition, energy efficiency is promoted through informal and formal presentations to staff and Council. Further, energy efficiency and sustainability is promoted through advertisements and posters in County publications.

3.2.1.3 Bi-Monthly Energy Tips on Meeting Agendas

On April 6, 2016 the Norfolk County Senior Leadership Team approved an Energy Conservation Committee request to establish “Energy Conservation” on department agendas on a bi-monthly basis. Simple energy tips or energy related topics of discussion are provided to meeting organizers as a no-cost method to raise energy awareness throughout the Corporation.

3.2.2 Norfolk County Energy Conservation Committee

The Norfolk County Energy Conservation Committee meets quarterly and currently has ten members. The role of the Norfolk County Energy Conservation Committee is to promote energy awareness among staff, integrate strategic energy efficiency measures throughout the Corporation and to oversee the development and implementation of the Energy Conservation and Demand Management Plan.

The ten Committee members in 2019 include: Norfolk County Councillor Chris Van Paassen, Marlene Watson (Director, Facilities), Michael Simoes (Contracts Coordinator, Energy and Facilities), Adam Kannawin (Supervisor, Parks and Recreation Operations (West)), JJ Knott (Program Lead, Health Energy Leaders- Canada), Mark Boerkamp (Supervisor, Trails and Cemeteries), Peter Klesch (Supervisor, Facilities Services, Norview Lodge), Scott Squires (Manager, I.T. Infrastructure), Michael Hawkins (Supervisor, Facilities) and Elizabeth Berestecki (Data Analysis Coordinator, Children’s Services).

3.2.3 County Energy Data Management

The passing of the Green Energy Act in Ontario (now Ontario Regulation 507/18) requires that the County report the annual energy consumption of all County facilities. To meet this requirement and to provide benchmarking, historical consumption trending, bill anomaly review and energy efficiency measure results, energy management software is used by the County.

In 2009, Norfolk County was one of six Ontario municipalities to purchase the energy management software Energy and Environmental Management System (EEMS) from York Region. EEMS was used by Norfolk County until 2017, when Norfolk County

elected to transfer to the no-cost software Energy Star Portfolio Manager. Energy Star Portfolio Manager allows: benchmarking across more facilities (more than 450,000 properties including public and private sectors), a more user-friendly interface for all County staff to review the energy performance of their facility and the ability to apply for Energy Star certification for our high performance facilities.

Currently, the County's 325 bills for electricity and natural gas accounts are manually entered into Energy Star Portfolio Manager monthly. Energy Star Portfolio Manager has the ability to complete auto-bill entry of utility bills with data provided directly from utilities; however, our utilities have not registered as service providers of this service.

3.2.4 County Energy Procurement

The Corporation of Norfolk County currently procures its electricity and natural gas through the Local Authority Services (a division of the Association of Municipalities of Ontario) through their natural gas and electricity programs. Norfolk County fuel is competitively procured in a bulk procurement.

3.2.5 County Energy Retrofits

The Corporation of Norfolk County has developed and implemented numerous energy efficiency retrofits based on an external energy audit completed in 2007 and internal audits completed by staff. Completed projects to-date include projects with short simple payback periods (i.e. less than 4 years), such as: lighting retrofits, building envelope/insulation upgrades and HVAC control systems.

Further, as County energy consuming assets exceed their expected life and require replacement, energy efficiency plays an important role in the selection of replacement assets.

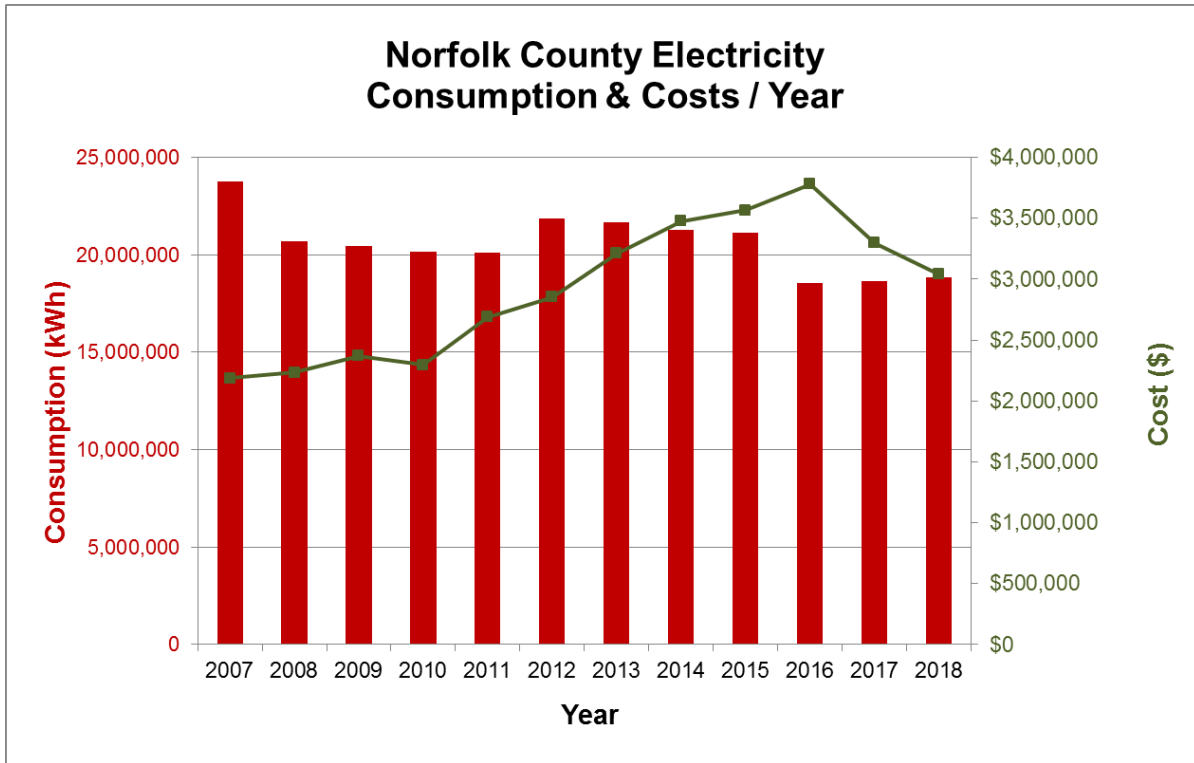
3.2.5.1 Norfolk County Energy Conservation Policy

A corporate energy conservation policy was initially approved by Norfolk County Council in September 2014. The original policy outlined guidelines for the energy efficient use of Norfolk County energy consuming assets. The Policy was revised in October 2017 to include energy design guidelines for renovations, new construction and life cycle replacements of all energy consuming equipment. The Policy assists staff to select efficient equipment to meet our sustainability goals by reducing our energy consumption, GHG emissions and total life cycle costs.

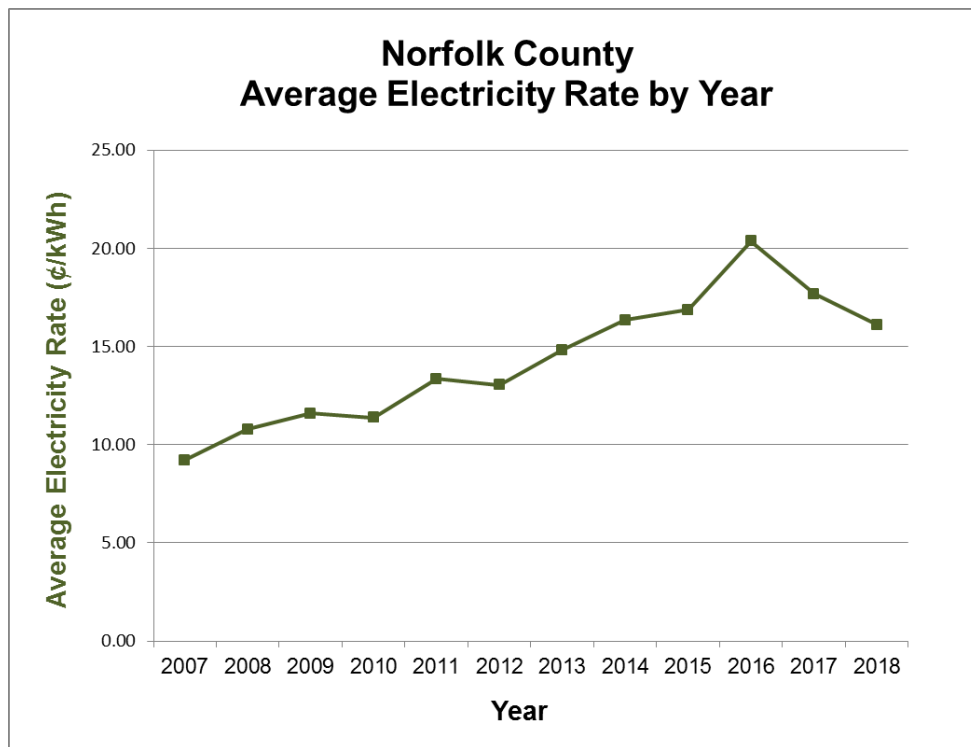
3.3 Historical County Energy Use, Costs and GHG Emissions

To place the baseline in context, the historical County energy use, costs and emissions are presented in the following charts.

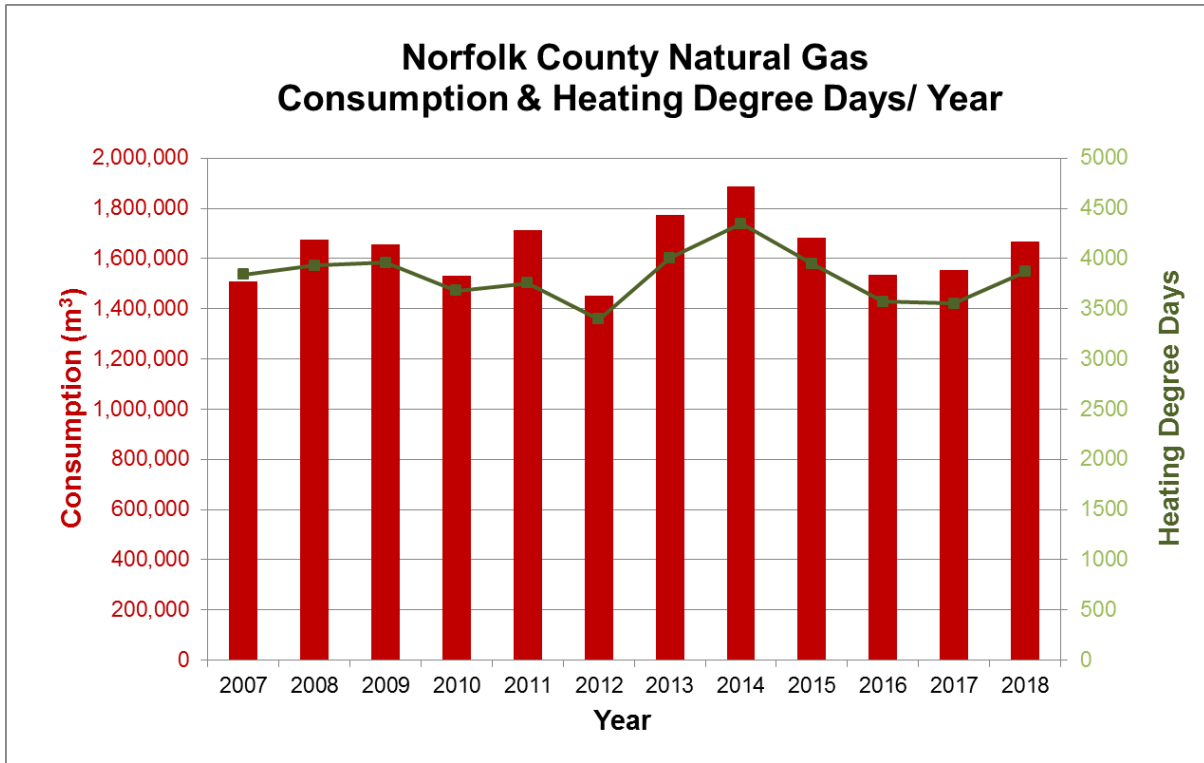
3.3.1 County Electricity Consumption & Costs / Year 2007-2018



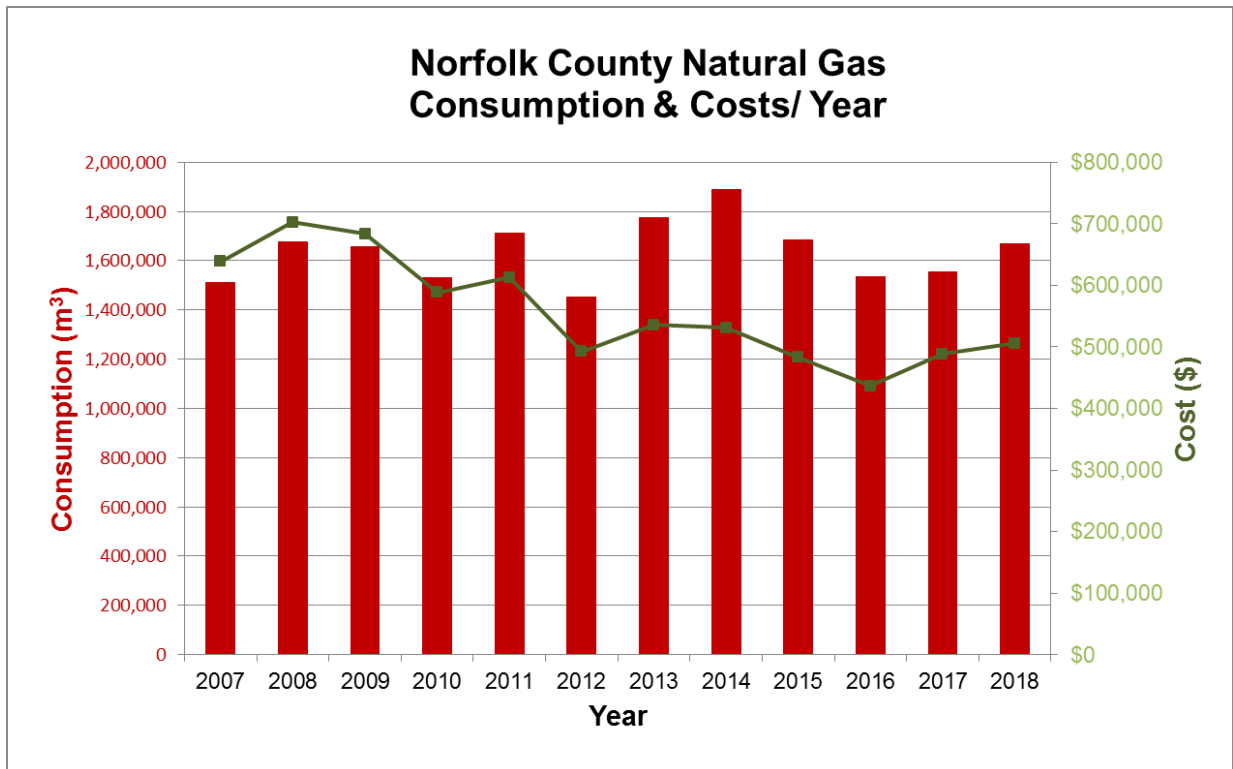
3.3.2 County Average Electricity Rate by Year 2007-2018



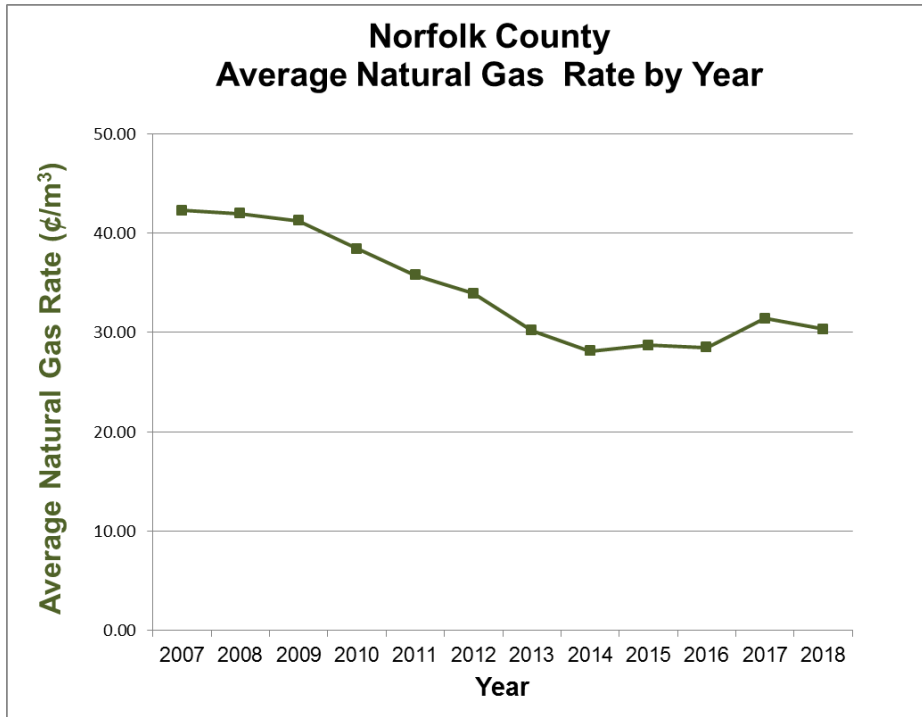
3.3.3 County Natural Gas Consumption & Heating Degree Days / Year



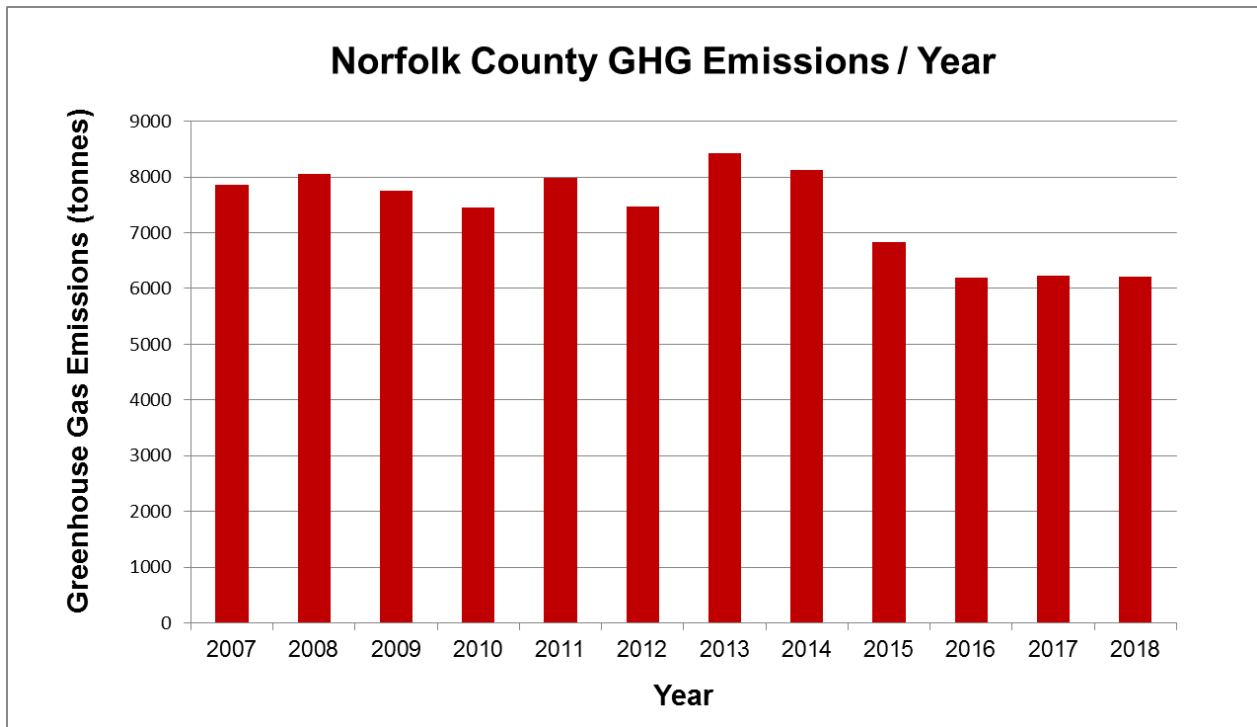
3.3.4 County Natural Gas Consumption & Costs / Year 2007-2018



3.3.5 County Average Natural Gas Rate by Year 2007-2018



3.3.6 County GHG Emissions / Year 2007-2018



3.4 Baseline Statistics – 2018

The following energy statistics have been developed to form the baseline to which future actions can be measured and evaluated. Detailed energy consumption for each County facility can be found in Appendix A.

3.4.1 Energy Consumption Statistics 2018

2018 Electricity Consumption = 18,850,061 kWh

2018 Natural Gas Consumption = 1,668,952 m³

2018 Diesel Consumption = 507,617 L

2018 Gasoline Consumption = 394,207 L

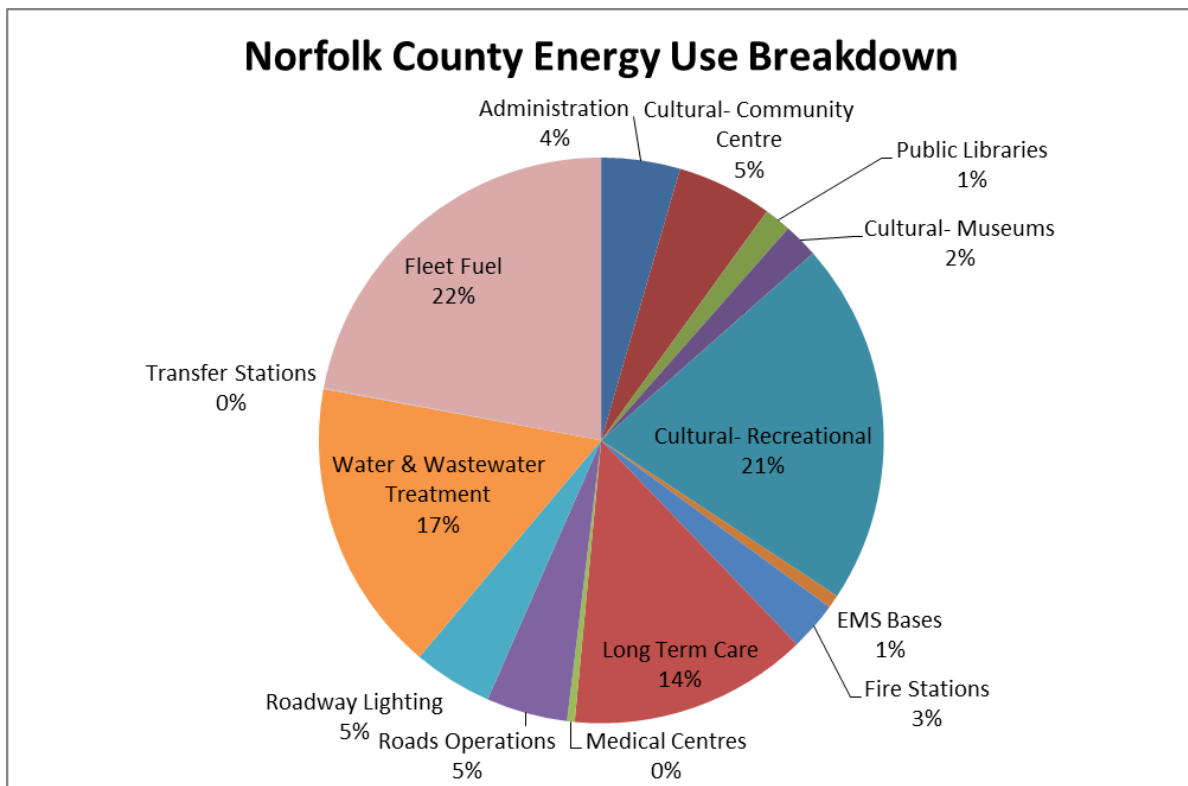
2018 Reimbursed Mileage (km) = 1,001,199 km ~ 140,168 L

Total Energy Consumption in kBTU = 160,470,852.10 kBTU

Total Energy Generation in kBTU = 11,570 kWh = 39,476.84 kBTU

Total Net Energy Consumption in kBTU = 160,431,375.26 kBTU

3.4.1.1 Energy Consumption Breakdown



3.4.2 Energy Cost Statistics 2018

2018 Electricity Costs = \$3,038,887.79 [Average = 16.12 ¢ / kWh]

2018 Natural Gas Costs = \$505,932.07 [Average = 30.31 ¢ / m³]

2018 Diesel Costs = \$505,830.13 [Average = 99.6 ¢ / L]

2018 Gasoline Costs = \$377,066.88 [Average = 95.7 ¢ / L]

2018 Estimated Fuel Costs for Reimbursed Mileage = \$134,073.50

Total Energy Costs = \$4,561,790.37

3.4.3 Energy Intensity Statistics

Property Category	Total Gross Building Area (ft ²)	Total Energy Use (kBTU)	2018 Energy Use Intensity (kBTU / ft ²)
Administration	126,468	7,235,052	57.21
Public Libraries	47,026	2,460,897	52.33
Cultural Facilities- Recreational Facilities	358,604	33,348,808	93.00
Cultural Facilities- Community Centres	115,363	8,776,436	76.08
Cultural Facilities- Museums and Associated Facilities	60,019	3,183,909	53.05
Cultural Facilities- Medical Centres	13,694	707,031	21.18
EMS Bases and Associated Facilities	20,035	1,208,629	60.33
Fire Stations and Associated Facilities	83,463	4,484,384	53.73
Roads Operations & Storage Facilities	84,459	7,464,618	80.71
Long Term Care Facilities	123,845	21,944,583	177.19
Solid Waste Transfer Stations	850	80,112	94.25

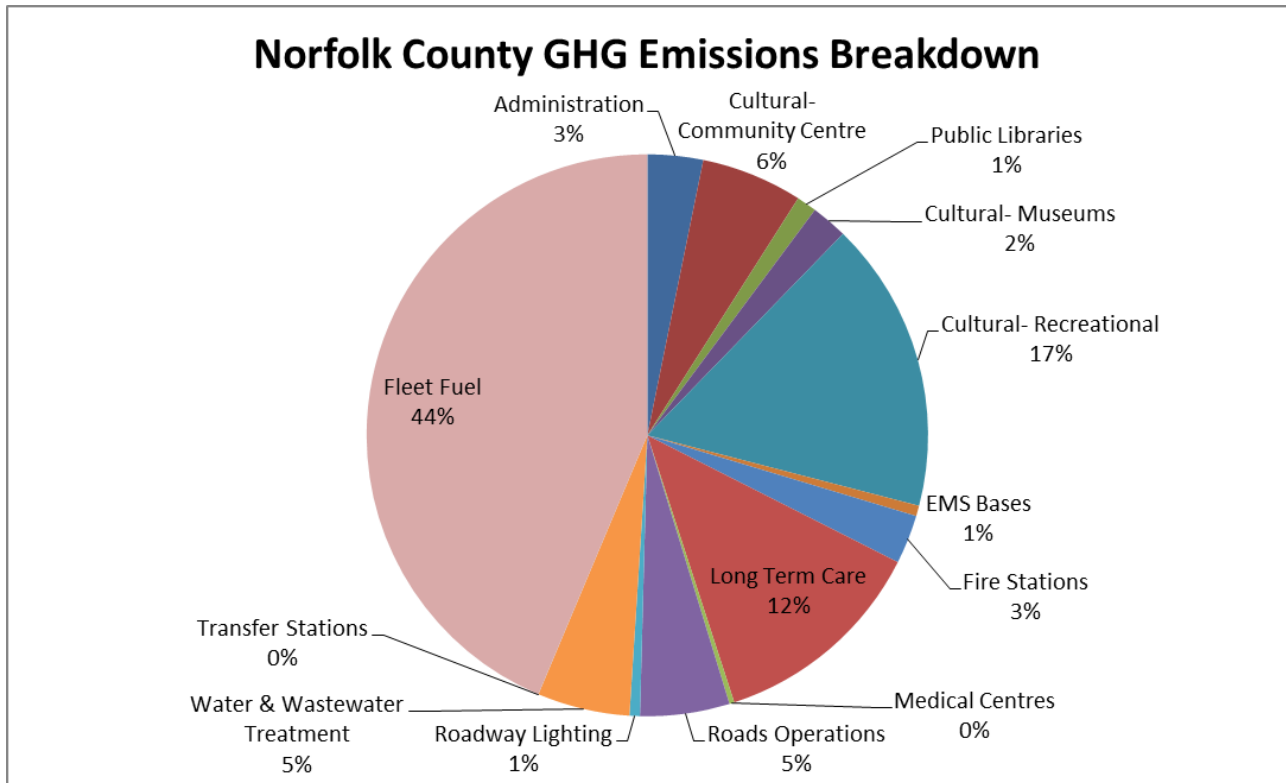
Property Category	Total Volume Discharged (m ³)	Total Energy Use (kBTU)	2018 Energy Use Intensity (kBTU / m ³)
Water Treatment & Distribution Facilities	5,094,521	10,512,082	2.06
Wastewater Treatment & Distribution Facilities	9,095,233	16,420,442	1.81

3.4.4 GHG Emissions

2018 Total GHG Emissions = 6,205.98 tonnes

2018 Net GHG Emissions (Total- Carbon Sequestration of County Woodlots) = 6,205.98 tonnes- 5,562.5 tonnes = 643.48 tonnes

3.4.4.1 GHG Emissions Breakdown Chart



3.5 2014-2019 Plan Goals & Objectives Results

The 2014-2019 Norfolk County Energy Conservation and Demand Management Plan outlined five strategic goals to achieve the 2019 vision. Each goal included specific objectives for the County. The results of the previous Plan are summarized below.

3.5.1 Objective: To develop a County energy management program

Goal	Status	Comments:
Create a Corporate energy database with all energy consuming equipment and incorporate database into life-cycle planning	Complete	
Establish a Community Energy Plan	In Progress	Norfolk County Council has approved the development of a Climate

Goal	Status	Comments:
		Change Adaptation and GHG Emissions Reduction Plan in 2019.
Review corporate and community energy plans with key stakeholders annually	Complete	
Establish and record key performance indicators commencing in 2014. Report annually the key performance indicators to Council	Complete	

3.5.2 Objective: To reduce weather-corrected energy consumption intensity below 2013 levels

Goal	Status	Comments:
Reduce County weather-corrected energy intensity in non-water/wastewater facilities by 10% below 2013 levels by 2019	Not Met.	Intensity was reduced by 9.44%, 0.56% lower than target.
Reduce County street/traffic light energy intensity by 40% below 2013 levels by 2019	Complete	
Reduce total energy consumption in 80% of Norfolk County facilities below 2013 levels by 2019	Complete	

3.5.3 Objective: To reduce net annual carbon emissions

Goal	Status	Comments:
Reduce total annual carbon emissions from fleet, facilities and streetlights from 2013 levels by 2019.	Complete	

3.5.4 Objective: To promote sustainable energy use by generating and using renewable energy.

Goal	Status	Comments:
Generate 5% of the County's electricity consumption through renewable energy sources by 2019.	Not Met	2018 renewable energy generation was 0.06%, despite efforts to proceed with large rooftop solar and micro-hydro projects.

3.5.5 Objective: To reduce total annual operating utility costs intensity.

Goal	Status	Comments:
Despite an expected 40% increase in electricity costs, hold electricity cost intensity to a maximum 10% increase over 2013 levels	Complete	
Despite rising natural gas costs, reduce total annual natural gas cost intensity from 2013 levels by 5% by 2019	Not met	Natural gas cost intensity was unchanged since 2013.
Reduce total annual fuel costs from 2013 levels by 5% by 2019	Complete	

4.0 Energy Efficiency Measures

Energy efficiency measures are the specific actions the County will undertake to achieve the 2024 energy vision for Norfolk County.

4.1 Historical Energy Efficiency Measures and Results

To develop effective future energy efficiency measures, previous County energy efficiency measures should be reviewed to ensure positive results are realized. Although, the County does not currently complete formal measurement and verification (i.e. sub-metering, etc.) processes for County energy retrofit projects, savings can be accurately estimated with the use of available physical, operational and energy billing information.

4.1.1 Facility Lighting Retrofits

As a very strong return on investment energy efficiency measure, lighting retrofits have been completed at all County facilities since 2011. A target of a 2-5 year simple payback (approximately 20 to 50% return on investment) on only energy cost savings has been used by staff as a minimum requirement for any recommendations for facility lighting retrofits. Previous lighting retrofits included the replacement of our inefficient T12, incandescent and high pressure sodium lamps and fixtures to high efficiency fluorescent fixtures and select LED bulb replacements. These previous investments in lighting retrofits have since paid for themselves and continue to provide cost avoidance savings annually.

Total Costs of Lighting Retrofits since 2011 = \$495,000

Total External Funding for Lighting Retrofits (IESO Rebates) = \$58,000

Total Net Cost of Lighting Retrofits since 2011 = \$ 437,000

Cost Avoidance of Lighting Retrofits to 2019 = \$567,600

Further, Norfolk County has participated in the Hydro One “Small Business Lighting Program” in 2009 and 2013 at 74 County facilities. The Program provides eligible small businesses with up to \$2,000 worth of lighting upgrades per facility at no cost.

4.1.2 Street Lighting Retrofit

In 2015/2016, Norfolk County converted all of its 4,069 “cobra-head” style street lights and 67 “decorative” street lights to LED. The net cost (total cost minus Independent Electricity System Operator rebate) of the LED conversion in 2015-2016 was \$1,614,000. A simple payback of 3.29 years was estimated by our street lighting conversion designers. County electricity costs have been reduced from \$741,618 in 2015 to \$327,426 in 2018. Further, maintenance costs were reduced and the County is on track to completely pay back the initial investment in 2020.

4.1.3 HVAC Retrofits

Due to the lower financial returns associated with retrofitting HVAC equipment, minimal retrofits of County HVAC equipment have been completed with the sole purpose of improving energy efficiency. However, when County HVAC equipment requires replacement, high energy efficient equipment and systems are selected as a replacement. Additional initial costs associated with the selection of high efficiency equipment are partially offset through external funding sources such as Union Gas and IESO incentives. The remaining additional initial costs of the high efficiency equipment have a simple payback between 1-5 years (or return on investment of 20% to 100%).

In addition, thermostats within County facilities have been replaced with remote-access, occupancy controlled thermostats. Energy consumption is reduced by increasing the amount of time the HVAC equipment are in unoccupied mode and through fuel consumption reduction by remote alterations to thermostats. 100 thermostats have been replaced County-wide at a cost of \$20,000. Cost avoidance of the thermostats to December 31, 2018 was \$3,220. It should be noted that approximately one half of the above thermostats were purchased and installed in late 2018 and only have approximately one month of savings.

4.1.4 Building Insulation & Envelope Upgrades

Due to the lower financial returns associated with building insulation upgrades, minimal building insulation and envelope upgrades have been completed. Insulation upgrades have been completed at the following facilities: Delhi Tobacco Museum & Heritage Centre, County Administration Building, Port Dover Harbour Museum, Port Dover Beach Washrooms, Port Rowan EMS Base and the Norfolk Arts Centre. Total costs of

insulation and envelope upgrades to 2018 are \$31,400, and the return on investment of upgrades has ranged from 7 to 13%.

4.1.5 Energy Awareness Program

As described above, eleven energy competitions have been held since 2014 and have generated over 484,007 ekWh (or \$37,123 in avoided costs) in measureable energy savings.

4.2 Proposed Energy Efficiency Measures

Due to fast pace of change in the energy industry, a detailed short-term plan (2019-2021) has been developed for this Plan. The Plan will be reviewed annually by the Energy Conservation Committee and proposed changes will occur through County budget process. Further, a major review and update of the Plan will occur in 2022.

4.2.1 2019

4.2.1.1 Interior LED Retrofits

Description: Replacement of fluorescent light tubes and/or fixtures with high efficiency LED tubes of fixtures within County facilities.

Justification: LED tubes and fixtures use approximately 40% less electricity and have approximately double the expected life of equivalent fluorescent fixtures reducing replacement and recycling costs. LED tubes and fixtures are being installed County-wide as fluorescents reach end of life as the most economical long term replacement. In late 2018, Norfolk County staff elected to participate in the Hydro One “Small Business Lighting Program”. It is estimated that the County will receive \$130,000 in no-cost lighting upgrades through the Program in 2019.

Financial and Energy Summary:

Initial Cost = \$50,000

Rebates or Incentives = \$135,000 of lighting upgrades and rebates

Annual Cost Savings = \$35,000

Total Annual Energy Savings = 200,000 kWh

4.2.1.2 Weather-stripping Program

Description: Annual replacement of failed or non-existent exterior door weather-stripping within County facilities.

Justification: Weather-stripping replacements reduce energy consumption by sealing air leakage and improving the air tightness of the building. Air leaks account for approximately 10-20% of a facilities' energy use. Replacing failed or non-existent exterior door weather-stripping, will reduce the facility energy use by approximately 2-3%.

Financial and Energy Summary:

Initial Cost = \$5,000

Annual Cost Savings = \$800

Total Annual Energy Savings = 5,500 kWh

4.2.1.3 Waterford EMS Base Addition- High Efficiency Design

Description: The Waterford EMS Base addition scheduled for construction in 2019 will include a high energy efficiency design including: in-floor radiant heating, high efficiency boilers and furnace, LED lighting, energy recovery ventilators (ERV)'s, etc.

Justification: Beginning of life cycle is the opportune time to make investments in energy efficient and sustainable building components. Additional initial costs associated with the selection of high efficiency equipment will be partially offset through external funding sources such as Union Gas and IESO incentives.

Financial and Energy Summary:

Initial Cost = Included in Project Budget

Annual Cost Savings = To be determined through detailed design

Total Annual Energy Savings = To be determined through detailed design

4.2.1.4 Building Envelope and Insulation Upgrades Program

Description: Installation of insulation or building envelope components which improve the energy efficiency of County facilities. 2019 facilities to be upgraded: Waterford Branch Library, Port Rowan Medical Centre, Port Rowan Library and Port Dover EMS Base.

Justification: Replacements will reduce energy consumption by increasing the insulation of ceiling and exterior walls or increasing air tightness of the building. Upgrades typically have a return on investment of approximately 10%, but are highly dependent on existing site conditions.

Financial and Energy Summary:

Initial Cost = \$20,000

Annual Cost Savings = \$2,000

Total Annual Energy Savings = 6,000 m³

4.2.1.5 HVAC Upgrades

Description: The HVAC equipment at the following facilities requires replacement in 2019: Port Rowan Medical Centre, Langton Arena, Port Dover Arena, Adult Community Centre and Port Dover Community Centre. Equipment will be replaced with high efficiency, Energy Star certified equipment.

Justification: Additional initial costs associated with the selection of high efficiency equipment are partially offset through external funding sources such as Union Gas and IESO incentives. The remaining additional initial costs of the high efficiency equipment have a simple payback between 1-5 years (or return on investment of 20% to 100%).

Financial and Energy Summary:

Initial Cost (Additional Costs)= \$7,000

Rebates or Incentives = \$5,000

Annual Cost Savings (Additional) = \$1,000

Total Annual Energy Savings (Additional) = 3,000 m³

4.2.1.6 LED Street Lighting Retrofit Project

Description: Replacement of high pressure sodium decorative street light fixtures with high efficiency LED fixtures. This project is being combined with end of useful life replacements of street light transformer poles.

Justification: LED fixtures use approximately 50% less electricity and have approximately four times the expected life of equivalent high pressure sodium fixtures reducing maintenance costs.

Financial and Energy Summary:

Initial Cost = \$150,000

Rebates or Incentives = \$3,000

Annual Energy Cost Savings = \$13,000 (maintenance costs also to be reduced)

Total Annual Energy Savings = 78,000 kWh

4.2.1.7 Public Energy Awareness Program

Description: Expansion of existing County communication channels to promote energy efficiency and sustainability to Norfolk County citizens and businesses. Program will continue through 2024.

Justification: Energy costs are expected to significantly rise in the next five years and will affect all Norfolk County citizens and businesses. The public energy awareness program is a low-cost way to assist local businesses in realizing greater profitability and would lead to higher retention of existing businesses. Further, citizens would also benefit by reduced home energy costs.

Financial and Energy Summary:

Initial Cost (Additional Costs)= \$1,000

Potential energy savings to County citizens and businesses are significant but difficult to quantify without measurable data.

4.2.1.8 Energy Efficiency Integration into County Procurement

Description: Update of the Norfolk County Purchasing Policy & Procedures to promote energy efficiency considerations when procuring goods and services.

Justification: Beginning of life cycle is the opportune time to make investments in energy efficiency and sustainability. Norfolk County currently has a corporate Energy Conservation Policy; however the Policy is not referenced within the County Purchasing Policy. By providing a direct reference, vendors of Norfolk County will be required to provide energy efficient and low total life-cycle cost goods and services.

Financial and Energy Summary:

Initial Cost = \$0 (minimal staff time)

4.2.1.9 Staff Energy Efficiency Training Program

Description: Inclusion of Norfolk County energy conservation policy overview in the training and orientation process for new Norfolk County employees. Program will continue through 2024.

Justification: A no-cost way to improve energy awareness of County staff. Increased energy awareness will improve performance and understanding of Norfolk County energy efficiency goals.

Financial and Energy Summary:

Initial Cost = \$0 (minimal staff time)

4.2.2 2020

4.2.2.1 Interior LED Retrofits

Description: Replacement of fluorescent light tubes and/or fixtures with high efficiency LED tubes of fixtures within County facilities. 2020 retrofit facilities include: County Administration Building, Delhi Administration Building, Talbot Gardens Arena, Annaliese Carr Aquatic Centre & Simcoe Recreation Centre, Delhi Community Centre Arena, Waterford Tricenturena, Port Dover Arena, Langton Arena, Port Dover Community Centre, Vittoria Community Centre, Langton Community Centre, Waterford Lions Community Centre and Norview Lodge.

Justification: LED tubes and fixtures use approximately 40% less electricity and have approximately double the expected life of equivalent fluorescent fixtures. LED tubes and fixtures are being installed County-wide as fluorescents reach end of life as the most economical long term replacement.

Financial and Energy Summary:

Initial Cost = \$300,000

Rebates or Incentives = \$25,000

Annual Cost Savings = \$60,000

Total Annual Energy Savings = 375,000 kWh

4.2.2.2 Exterior Lighting Controls Retrofit

Description: Replacement of manual exterior lighting timers with programmable, remote-access controllers.

Justification: The exterior lights on County facilities are currently controlled through either photocell control (located directly on exterior light fixtures) or manual electronic timers. Manual electronic timers require staff to manually adjust the time period which the exterior lights remain on during the night throughout the year. Programmable controllers with remote-access would reduce the energy consumption of exterior lights through better control and reduce the travel time/costs of staff to make the adjustments.

Financial and Energy Summary:

Initial Cost = \$15,000

Rebates or Incentives = TBD

Annual Cost Savings of Energy = \$2,000

Total Annual Energy Savings = 13,000 kWh

4.2.2.3 LED Street Lighting Retrofit Project

Description: Replacement of 163 high pressure sodium decorative street light fixtures with high efficiency LED fixtures.

Justification: LED fixtures use approximately 50% less electricity and have approximately four times the expected life of equivalent high pressure sodium fixtures reducing maintenance costs.

Financial and Energy Summary:

Initial Cost = \$150,000

Rebates or Incentives = \$12,000

Annual Energy Cost Savings = \$13,000 (maintenance costs also to be reduced)

Total Annual Energy Savings = 78,000 kWh

4.2.2.4 Building Operator / Building Commissioning Training Program

Description: Professional on-site training for County building operators that are responsible for the daily maintenance and operation of large County buildings with complex HVAC and electrical systems.

Justification: Formalized on-site training for County building operators will provide hands-on training to identify ways to improve the energy efficiency of County buildings through operations and maintenance. Building Operator Certification (BOC) reports that organizations that have certified building operators use, on average, 2.5% less energy.

Financial and Energy Summary:

Cost = ~\$15,000

Rebates / Incentives = TBD- Potential for 50% Funding

Annual Cost Savings = \$15,000

Total Annual Energy Savings = 80,000 kWh & 10,000 m³

4.2.2.5 Carpool Program

Description: Integration of carpool or smart commuting program into County policies and procedures to encourage additional carpooling by County staff when travelling between County facilities.

Justification: A carpool or smart commuting program would encourage active and sustainable transportation and decrease reliance on vehicular transportation. There would also be a reduction in the reimbursed mileage, fleet fuel consumption and GHG emissions.

Financial and Energy Summary:

Cost = \$0

Rebates / Incentives = N/A

Annual Cost Savings = \$5,000

Total Annual Energy Savings = 5,000 L

4.2.2.6 Electric Fleet Pilot Project

Description: Purchase of an electric vehicle and installation of an electric charging station at the Delhi Administration Building.

Justification: Norfolk County fleet fuel accounts for 44% of Norfolk County's annual GHG emissions. Electric vehicles reduce greenhouse gas emissions by up to 90% and reduce annual fuel costs. The pilot project vehicle will be stationed at the Delhi Administration Building for use by the 35 staff that are currently based in the facility. It is estimated that the vehicle will reduce reimbursable mileage by staff by 12,000 km's per year providing a financial return on investment of 7% as well as significant GHG emission reductions.

Financial and Energy Summary:

Cost = \$60,000

Rebates / Incentives = \$5,000

Annual Cost Savings = \$4,000

Total Annual GHG Savings = 2,705 kg GHG

4.2.2.7 Rooftop Solar Net Metering Pilot Project

Description: Installation of a rooftop solar PV system at a County facility in a net metering billing arrangement. The rooftop solar PV system would provide electricity to the facility and sell any excess electricity to the grid.

Justification: A rooftop solar net metering project would promote sustainability and self-sufficiency through energy generation. Further, the pilot project would be a strong investment with an estimated return on investment of approximately 7%. Norfolk County currently pays up to 19 cents/kWh for electricity to be supplied through the grid, and rates are expected to rise in the next 5 years.

Financial and Energy Summary:

Cost = \$30,000

Rebates / Incentives = TBD

Annual Cost Savings = \$2,200

Total Annual Energy Savings = 11,000 kWh

4.2.2.8 Refrigerator / Freezer Replacement Program

Description: Bulk replacement of old, end of expected life refrigerators with new high efficiency refrigerators.

Justification: Older refrigerators and chest freezers (<1990) use approximately 2,000 kWh (\$300) of electricity per year. New refrigerators and chest freezers use approximately 450 kWh (\$68) of energy per year. Many older refrigerators/freezers have reached end of expected life and are due for replacement, this program will replace the fridges in a bulk purchase annually.

Financial and Energy Summary:

Initial Costs = \$25,000

Rebates / Incentives = TBD

Annual Cost Savings = \$6,000

Total Annual Energy Savings = 40,000 kWh

4.2.2.9 Energy Revolving Fund

Description: Provide a report to Council for the consideration of the establishment of a formal green revolving fund.

Justification: Norfolk County currently has an energy reserve that is funded through energy conservation rebates and incentives. The reserve is used to fund energy conservation projects. Other Ontario municipalities and corporations have a similar revolving fund, but the fund is replenished through calculated energy savings. This approach requires additional measurement and verification of energy conservation projects, but will provide more transparency and funding opportunities.

4.2.2.10 Sustainability Considerations Integration into County Procurement

Description: Update of the Norfolk County Purchasing Policy & Procedures to promote total life cycle cost analysis, energy efficiency and environmental sustainability as evaluation criteria when procuring goods and services. Update of the Norfolk County Energy Conservation Policy with respect to facility design guidelines to reflect changing trends and to promote sustainability design.

Justification: Beginning of life cycle is the opportune time to make investments in energy efficiency and sustainability. Norfolk County can ensure that all County procurement is reviewed from a long-term fiscal and environmental sustainability perspective. Selecting products/services with minimal life-cycle impacts will save energy, reduce operating costs, reduce GHG emissions and increase the market for high performance products.

Financial and Energy Summary:

Initial Cost = \$0 (significant staff time will be required)

4.2.2.11 Weather-stripping Program

Description: Annual replacement of failed or non-existent exterior door weather-stripping within County facilities.

Justification: Weather-stripping replacements reduce energy consumption by sealing air leakage and improving the air tightness of the building. Air leaks account for approximately 10-20% of a facilities' energy use. Replacing failed or non-existent exterior door weather-stripping, will reduce the facility energy use by approximately 2-3%.

Financial and Energy Summary:

Initial Cost = \$5,000

Annual Cost Savings = \$800

Total Annual Energy Savings = 5,500 kWh

4.2.2.12 Building Envelope and Insulation Upgrades Program

Description: Installation of insulation or building envelope components which improve the energy efficiency of County facilities. 2020 facilities to be upgraded will be determined in 2019 to be combined with other 2020 projects.

Justification: Replacements will reduce energy consumption by increasing the insulation of ceiling and exterior walls or increasing air tightness of the building.

Upgrades typically have a return on investment of approximately 10%, but are highly dependent on existing site conditions.

Financial and Energy Summary:

Initial Cost = \$20,000

Annual Cost Savings = \$2,000

Total Annual Energy Savings = 6,000 m³

4.2.2.13 HVAC Upgrades – Vestibule Heater Replacement Program

Description: Replacement of manual vestibule and cabinet heaters with programmable, remote-access controlled vestibule heaters.

Justification: The vestibule and cabinet heaters throughout various County facilities are original construction, have exceeded expected life and are currently controlled manually. Manual controls require staff to manually adjust cabinet heaters daily. Programmable controllers with remote-access would reduce the energy consumption of vestibule heaters through better control and reduce the travel time/costs of staff to make the daily adjustments.

Financial and Energy Summary:

Initial Cost (Additional Costs)= \$10,000

Rebates or Incentives = TBD

Annual Cost Savings (Additional) = \$1,000

Total Annual Energy Savings (Additional) = 6,200 kWh

4.2.3 2021

4.2.3.1 Rooftop Solar Net Metering / Off-Grid RFP

Description: Installation of a rooftop solar PV system at County facilities in a net metering / off-grid system. The rooftop solar PV system would provide electricity to the facility and sell any excess electricity to the grid or provide electricity to the facility and store excess in battery.

Justification: A rooftop solar project would promote sustainability and self-sufficiency through energy generation. Off-grid electricity generation could be attractive in facilities where the rooftop solar generation would provide more than the facility electrical

demand. An RFP would be developed to allow private businesses to create innovative, cost-effective solutions to providing renewable electricity at County facilities.

4.2.3.2 Weather-stripping Program

Description: Annual replacement of failed or non-existent exterior door weather-stripping within County facilities.

Justification: Weather-stripping replacements reduce energy consumption by sealing air leakage and improving the air tightness of the building. Air leaks account for approximately 10-20% of a facilities' energy use. Replacing failed or non-existent exterior door weather-stripping, will reduce the facility energy use by approximately 2-3%.

Financial and Energy Summary:

Initial Cost = \$5,000

Annual Cost Savings = \$800

Total Annual Energy Savings = 5,500 kWh

4.2.3.3 Building Envelope and Insulation Upgrades Program

Description: Installation of insulation or building envelope components which improve the energy efficiency of County facilities. 2021 facilities to be upgraded will be determined in 2020 to be combined with other 2021 projects.

Justification: Replacements will reduce energy consumption by increasing the insulation of ceiling and exterior walls or increasing air tightness of the building. Upgrades typically have a return on investment of approximately 10%, but are highly dependent on existing site conditions.

Financial and Energy Summary:

Initial Cost = \$20,000

Annual Cost Savings = \$2,000

Total Annual Energy Savings = 6,000 m³

4.2.3.4 HVAC Upgrades – Vestibule Heater Replacement Program

Description: Replacement of manual vestibule and cabinet heaters with programmable, remote-access controlled vestibule heaters.

Justification: The vestibule and cabinet heaters throughout various County facilities are original construction, have exceeded expected life and are currently controlled manually. Manual controls require staff to manually adjust cabinet heaters daily. Programmable controllers with remote-access would reduce the energy consumption of vestibule heaters through better control and reduce the travel time/costs of staff to make the daily adjustments.

Financial and Energy Summary:

Initial Cost (Additional Costs)= \$10,000

Rebates or Incentives = TBD

Annual Cost Savings (Additional) = \$1,000

Total Annual Energy Savings (Additional) = 6,200 kWh

4.2.3.5 Refrigerator / Freezer Replacement Program

Description: Bulk replacement of old, end of expected life refrigerators with new high efficiency refrigerators.

Justification: Older refrigerators and chest freezers (<1990) use approximately 2,000 kWh (\$300) of electricity per year. New refrigerators and chest freezers use approximately 450 kWh (\$68) of energy per year. Many older refrigerators/freezers have reached end of expected life and are due for replacement, this program will replace the fridges in a bulk purchase annually.

Financial and Energy Summary:

Initial Costs = \$25,000

Rebates / Incentives = TBD

Annual Cost Savings = \$6,000

Total Annual Energy Savings = 40,000 kWh

4.2.3.6 LED Street Lighting Retrofit Project

Description: Replacement of high pressure sodium decorative street light fixtures with high efficiency LED fixtures. This project is being combined with end of useful life replacements of street light transformer poles.

Justification: LED fixtures use approximately 50% less electricity and have approximately four times the expected life of equivalent high pressure sodium fixtures reducing maintenance costs.

Financial and Energy Summary:

Initial Cost = \$150,000

Rebates or Incentives = \$12,000

Annual Energy Cost Savings = \$13,000 (maintenance costs also to be reduced)

Total Annual Energy Savings = 78,000 kWh

4.2.3.7 Interior LED Retrofits

Description: Replacement of fluorescent light tubes and/or fixtures with high efficiency LED tubes of fixtures within County facilities. 2021 retrofit facilities include: Community Services Administration Building, Gilbertson Administration Building, Norfolk County Garage, Simcoe Branch Library, Waterford Branch Library, Teeterville Fire Station, Delhi Fire Station, Courtland Fire Station, St. Williams Fire Station, Vittoria Fire Station, Port Dover Harbour Marina and the Schellburg Operations Facility.

Justification: LED tubes and fixtures use approximately 40% less electricity and have approximately double the expected life of equivalent fluorescent fixtures. LED tubes and fixtures are being installed County-wide as fluorescents reach end of life as the most economical long term replacement.

Financial and Energy Summary:

Initial Cost = \$200,000

Rebates or Incentives = \$15,000

Annual Cost Savings = \$40,000

Total Annual Energy Savings = 275,000 kWh

4.2.4 2022

4.2.4.1 LED Street Lighting Retrofit Project

Description: Replacement of high pressure sodium decorative street light fixtures with high efficiency LED fixtures.

Justification: LED fixtures use approximately 50% less electricity and have approximately four times the expected life of equivalent high pressure sodium fixtures reducing maintenance costs.

Financial and Energy Summary:

Initial Cost = \$150,000

Rebates or Incentives = \$12,000

Annual Energy Cost Savings = \$13,000 (maintenance costs also to be reduced)

Total Annual Energy Savings = 78,000 kWh

4.2.4.2 Review Energy Plan

Description: The 2019-2024 Energy Conservation and Demand Management Plan will be reviewed and updated in 2022.

Justification: Due to decreasing costs of renewable energy, increasing energy costs, pending implementation of carbon pricing and funding opportunities for GHG emissions reductions, the current Plan is expected to be required to be updated in 2022.

4.2.4.3 Building Envelope and Insulation Upgrades Program

Description: Installation of insulation or building envelope components which improve the energy efficiency of County facilities. 2022 facilities to be upgraded will be determined in 2021 to be combined with other 2022 projects.

Justification: Replacements will reduce energy consumption by increasing the insulation of ceiling and exterior walls or increasing air tightness of the building. Upgrades typically have a return on investment of approximately 10%, but are highly dependent on existing site conditions.

Financial and Energy Summary:

Initial Cost = \$20,000

Annual Cost Savings = \$2,000

4.2.4.4 Weather-stripping Program

Description: Annual replacement of failed or non-existent exterior door weather-stripping within County facilities.

Justification: Weather-stripping replacements reduce energy consumption by sealing air leakage and improving the air tightness of the building. Air leaks account for

approximately 10-20% of a facilities' energy use. Replacing failed or non-existent exterior door weather-stripping, will reduce the facility energy use by approximately 2-3%.

Financial and Energy Summary:

Initial Cost = \$5,000

Annual Cost Savings = \$800

Total Annual Energy Savings = 5,500 kWh

4.2.5 2023

To be determined based on 2022 Plan review.

4.3 Financial Summary

Summary of Energy Efficiency Measures Costs

Energy Efficiency Measure	Capital Cost					
	2019	2020	2021	2022	2023	2019-2023
Interior LED Retrofits	\$50,000	\$300,000	\$200,000	-	-	\$550,000
Weather-Stripping Program	\$5,000	\$5,000	\$5,000	\$5,000	-	\$20,000
Building Envelope and Insulation Program	\$20,000	\$20,000	\$20,000	\$20,000	-	\$80,000
HVAC Upgrades	\$2,000	\$5,000	\$5,000	\$5,000	-	\$17,000
LED Street Lighting Retrofit Program	\$150,000	\$150,000	\$150,000	\$150,000	-	\$600,000
Public Energy Awareness Program	\$1,000	\$2,000	\$2,000	\$2,000	-	\$7,000
Exterior Lighting Controls Retrofit	-	\$15,000	-	-	-	\$15,000
Building Operator/Commissioning Training	-	\$15,000	-	-	-	\$15,000
Carpool / Smart Commute Program	-	-	-	-	-	-
Electric Fleet Pilot Project	-	\$60,000	-	-	-	\$60,000
Rooftop Solar Net Metering Project	-	\$25,000	-	-	-	\$25,000
Refrigerator / Freezer Replacement Program	-	\$25,000	\$25,000	-	-	\$50,000
Energy Revolving Fund	-	-	-	-	-	-
HVAC Upgrades – Vestibule Heaters	-	\$10,000	\$10,000	-	-	\$20,000
Rooftop Solar Net Metering / Off-Grid Project	-	-	TBD	-	-	-
TOTAL COST.....	<u>\$228,000</u>	<u>\$632,000</u>	<u>\$417,000</u>	<u>\$182,000</u>	<u>TBD</u>	<u>\$1,459,000</u>

Summary of Energy Efficiency Measures Cost Savings

Energy Efficiency Measure	Estimated Energy Cost Savings						
	2019	2020	2021	2022	2023	2024-2029	2019-2029
Interior LED Retrofits	-	\$35,000	\$96,750	\$141,588	\$148,667	\$862,552	\$1,284,557
Weather-Stripping Program	-	\$800	\$1,640	\$2,522	\$3,448	\$20,006	\$28,416
Building Envelope and Insulation Program	-	\$2,000	\$4,100	\$6,305	\$8,620	\$50,014	\$71,039
HVAC Upgrades	-	\$1,000	\$2,050	\$3,153	\$4,310	\$25,007	\$35,520
LED Street Lighting Retrofit Program	-	\$13,000	\$26,650	\$40,983	\$56,032	\$325,091	\$461,755
Public Energy Awareness Program	-	N/A	N/A	N/A	N/A	N/A	N/A
Exterior Lighting Controls Retrofit	-	-	\$2,000	\$2,100	\$2,205	\$12,793	\$19,098
Building Operator/Commissioning Training	-	-	\$15,000	\$15,750	\$16,538	\$95,949	\$143,237
Carpool / Smart Commute Program	-	-	\$5,000	\$5,250	\$5,513	\$31,983	\$47,746
Electric Fleet Pilot Project	-	-	\$4,000	\$4,200	\$4,410	\$25,586	\$38,196
Rooftop Solar Net Metering Project	-	-	\$2,200	\$2,310	\$2,426	\$14,073	\$21,008
Refrigerator / Freezer Replacement Program	-	-	\$6,000	\$12,300	\$12,915	\$74,932	\$106,147
Energy Revolving Fund	-	N/A	N/A	N/A	N/A	N/A	N/A
HVAC Upgrades – Vestibule Heaters	-	-	\$1,000	\$2,050	\$2,153	\$12,489	\$17,691
Rooftop Solar Net Metering / Off-Grid Project	-	-	TBD	TBD	TBD	TBD	TBD
TOTAL SAVINGS..... (assumes 5% inflation rate)	-	<u>\$51,800</u>	<u>\$166,390</u>	<u>\$238,510</u>	<u>\$267,235</u>	<u>\$1,550,474</u>	<u>\$2,274,409</u>

Appendix A – Detailed 2018 Energy Consumption

Administration Buildings

Facility	Address	Total Floor Area (ft ²)	Electricity (kWh)	Natural Gas (m ³)	GHG Emissions (kg CO ₂ e)	Energy Intensity (kBtu / ft ²)
Community Services Building-Admin Portion	95 Culver Street, Simcoe, ON	5,289	46,124.71	5,655.82	11,543.92	68.71
County Administration Building	50 Colborne Street South, Simcoe, ON	25,482	361,323.50	10,752.44	26,679.82	79.52
County Administration Building 2	60 Colborne Street South, Simcoe, ON	1,414	4,035.70	2,766.27	5,325.72	81.00
Delhi Administration Building	183 Main Street of Delhi, Delhi, ON	16,670	97,781.50	11,178.59	22,930.75	44.44
Gilbertson Administration Building	12 Gilbertson Drive, Simcoe, ON	34,365	255,248.70	34,371.85	69,721.81	61.78
Langton Administration Building	22 Albert Street, Langton, ON	13,928	71,877.20	8,765.09	17,897.00	40.53
Robinson Administration Building	185 Robinson Street, Simcoe, ON	26,820	263,944.20	16,326.59	35,586.23	55.75
Simcoe BIA Office	50 Peel Street, Simcoe, ON	2,500	14,164.20	4,414.76	8,633.06	83.65

Cultural- Community Centres

Facility	Address	Total Floor Area (ft ²)	Electricity (kWh)	Natural Gas (m ³)	GHG Emissions (kg CO ₂ e)	Energy Intensity (kBtu / ft ²)
Adult Community Centre	89 Pond Street, Simcoe, ON	27,648	132,543.40	42,862.84	83,732.14	72.83
Charlotteville Community Hall	1262 Turkey Point Road, Walsh, ON	4,716	23,371.90	6,323.37	12,418.69	65.75
Courtland Community Centre	272 Main Street of Courtland, Courtland, ON	6,580	49,048.10	9,418.12	18,742.86	77.57
Courtland Scout Hall	276 Main Street of Courtland, Courtland, ON	4,690	11,351.00	0.00	196.35	8.26
Delhi Friendship Centre & Parks Storage	418 Queen Street, Delhi, ON	3,969	11,983.00	5,320.00	10,315.28	59.12
Langton Community Center	28 Albert Street, Langton, ON	8,967	57,737.50	12,981.54	25,663.67	74.70
Port Dover Community Center	801 St. George Street, Port Dover, ON	14,905	115,354.00	28,320.12	55,803.62	95.62
Port Dover Kinsmen Scout Hall	95 Hamilton Plank Road, Port Dover, ON	1,559	7,976.00	4,397.79	8,493.77	120.21
Port Rowan Community Center	14 College Street, Port Rowan, ON	11,168	50,436.20	24,417.70	47,266.08	95.05
South Walsingham Hall	2070 Highway 59, Walsingham, ON	2,342	8,710.30	5,171.41	9,976.35	93.12
St. Williams Community Center	80 Queen Street West, St. Williams, ON	4,277	50,700.50	8,466.62	16,963.60	112.55

Facility	Address	Total Floor Area (ft ²)	Electricity (kWh)	Natural Gas (m ³)	GHG Emissions (kg CO ₂ e)	Energy Intensity (kBtu / ft ²)
Teeterville Woman's Institute Hall & Pioneer Museum	194 Teeter Street, Teeterville, ON	4,399	11,717.10	8,539.04	16,426.86	79.79
Vittoria Community Center	35 Oakes Boulevard, Vittoria, ON	10,904	39,687.80	19,878.63	38,455.92	78.82
Vittoria Old Town Hall	1538 Old Brock Street, Vittoria, ON	2,527	7,531.20	4,422.39	8,532.82	73.91
Waterford Lions Community Center	51 West Church Street, Waterford, ON	6,712	18,318.00	4,553.71	8,968.91	34.02

Public Libraries

Facility	Address	Total Floor Area (ft ²)	Electricity (kWh)	Natural Gas (m ³)	GHG Emissions (kg CO ₂ e)	Energy Intensity (kBtu / ft ²)
Delhi Branch Library	192 Main Street of Delhi, Delhi, ON	9,547	36,865.20	7,413.12	14,722.62	41.46
Port Rowan Library	1034 Bay Street, Port Rowan, ON	4,361	39,906.80	2,499.69	5,439.72	52.1
Simcoe Branch Library	46 Colborne Street South, Simcoe, ON	26,136	214,522.10	11,028.41	24,664.78	43.38
Waterford Branch Library	15 Main Street South, Waterford, ON	6,982	61,425.70	13,579.50	26,863.59	100.86

Cultural – Museums

Facility	Address	Total Floor Area (ft ²)	Electricity (kWh)	Natural Gas (m ³)	GHG Emissions (kg CO ₂ e)	Energy Intensity (kBtu / ft ²)
Alligator Tug Building	90 Argyle Street, Simcoe, ON	550	0.00	0.00	0.00	N/A
Carillon Tower	201 Norfolk Street North, Simcoe, ON	968	7,345.20	0.00	127.06	25.89
Delhi Tobacco Museum & Heritage Centre	200 Talbot Road, Delhi, ON	9,190	28,570.40	4,980.62	9,957.39	30.35
Eva Brook Donly Museum	109 Norfolk Street South, Simcoe, ON	11,928	55,448.80	12,589.13	24,878.50	54.31
Norfolk Arts Center	21 Lynnwood Avenue, Simcoe, ON	9,680	58,285.40	13,138.30	25,970.99	69.98
Port Dover Harbour Museum	44 Harbour Street, Port Dover, ON	7,988	40,138.70	9,137.10	18,054.81	58.81
Telegraph Office	88 Argyle Street, Simcoe, ON	100	37.00	0.00	0.64	1.26
Waterford Heritage & Agricultural Museum	159 Nichol Street, Waterford, ON	19,615	35,895.40	26,421.13	50,821.07	55.31

Cultural – Recreational

Facility	Address	Total Floor Area (ft ²)	Electricity (kWh)	Natural Gas (m ³)	GHG Emissions (kg CO ₂ e)	Energy Intensity (kBtu / ft ²)
Delhi Community Centre Arena	144 Western Street, Delhi, ON	59,326	626,134.20	50,148.73	106,113.46	66.80
Delhi Kinsmen Pool	366 Talbot Road, Delhi, ON	3,664	36,591.50	6,837.07	13,623.39	102.04
Delhi Soccer Club	510 Main Street of Delhi, Delhi, ON	6,525	87,908.00	0.00	1,520.63	45.97
Delhi Sports Park	144 Western Street, Delhi, ON	600	16,600.50	0.00	287.16	94.40
Langton Arena	30 Albert Street, Langton, ON	35,010	527,876.90	51,175.59	106,364.84	104.69
Main Street Public Washrooms	Main Street, Port Dover, ON	889	4,083.70	0.00	70.64	15.67
Norfolk County Youth Soccer Park	660 West Street, Simcoe, ON	2,144	15,561.10	0.00	269.18	24.76
Port Dover Arena	809 St. George Street, Port Dover, ON	55,732	473,365.40	60,677.95	123,476.38	68.64
Port Dover Harbour Marina	50 Passmore Avenue, Port Dover, ON	3,240	137,681.70	0.00	2,381.62	144.99
Simcoe Lions Park	75 Davis Street East, Simcoe, ON	1,342	38,144.50	0.00	659.82	96.98
Simcoe Memorial Park	273 Owen Street, Simcoe, ON	916	12,515.50	0.00	216.49	46.62
Simcoe Recreation Center Arena and Annaleise Carr Aquatic Centre	182 South Drive, Simcoe, ON	55,890	1,231,016.10	175,180.77	354,137.58	189.32
St. George Street Washrooms	9 St. George Street, Port Dover, ON	889	4,583.60	1,360.60	2,664.43	73.34
Talbot Gardens Arena	10 Talbot Street North, Simcoe, ON	70,337	582,845.20	102,255.65	204,367.79	81.23
Waterford Tricenturena	32 Church Street East, Waterford, ON	62,100	456,067.90	60,410.94	122,669.85	60.49
Alice Street Hydro - Pumpkinfest	Alice Street, Waterford, ON	N/A	439.90	0.00	7.61	N/A
Audrey S. Hellyer Memorial Park	32 East Church Street, Waterford, ON	N/A	1,358.00	0.00	23.49	N/A
Brant Hill C.S. Club	Brant Hill, Port Dover, ON	N/A	11,058.40	0.00	191.29	N/A
Bridge Alley Fountain	Bridge Alley, Port Dover, ON	N/A	807.90	0.00	13.98	N/A
Clifton Park	Clifton Park, Simcoe, ON	N/A	583.50	0.00	10.09	N/A
College Avenue Tennis Courts	College Avenue, Port Rowan, ON	N/A	634.40	0.00	10.97	N/A
Courtland Lions Community Ball Park	329 Main Street of Courtland, Courtland, ON	N/A	1,541.30	0.00	26.66	N/A
Courtland Tennis Courts	329 Main Street of Courtland, Courtland, ON	N/A	2,389.40	0.00	41.33	N/A
Fairground Ball Park	505 Fairground Road, Langton, ON	N/A	918.40	0.00	15.89	N/A
Front Road Park	3 Front Road Park, Port Rowan, ON	N/A	1,926.60	0.00	33.33	N/A

Facility	Address	Total Floor Area (ft ²)	Electricity (kWh)	Natural Gas (m ³)	GHG Emissions (kg CO _{2e})	Energy Intensity (kBTU / ft ²)
Harbour Basin Site	Harbour Basin, Port Rowan, ON	N/A	31,556.30	0.00	545.86	N/A
Heritage Park	Alice Street, Waterford, ON	N/A	768.10	0.00	13.29	N/A
Port Dover Ball Park	Highway 6, Port Dover, ON	N/A	350.1	0.00	6.06	N/A
Houghton Ball Park	699 County Road 28, Fairground, ON	N/A	161.10	0.00	2.79	N/A
Hunt Street Soccer Park	40 Hunt Street, Simcoe, ON	N/A	0.00	0.00	0.00	N/A
Kinsmen Park	Head Street North, Simcoe, ON	N/A	6,970.00	0.00	120.57	N/A
Port Rowan Baseball Park	College Avenue, Port Rowan, ON	N/A	0.00	0.00	0.00	N/A
Port Rowan Community Park	1084 Bay Street, Port Rowan, ON	N/A	290	0.00	5.02	N/A
Port Rowan Info Booth	Bay Street, Port Rowan, ON	N/A	683.80	0.00	11.83	N/A
Powell Park	Market Street East, Port Dover, ON	N/A	1,889.60	0.00	32.69	N/A
PR Harbour Commission	Front Road, Port Rowan, ON	N/A	3,605.80	0.00	62.37	N/A
St. Williams Ball Park	114 Queen Street East, St. Williams, ON	N/A	666.40	0.00	11.53	N/A
Stalker Park	390 Cedar Street, Simcoe, ON	N/A	1,012.80	0.00	17.52	N/A
Turkey Point Play Park Pavilion	4 Turkey Point Road, Turkey Point, ON	N/A	2,775.80	0.00	48.02	N/A
Walsingham Park	Walsingham, ON	N/A	3,774.90	0.00	65.30	N/A
Wellington Park	Bonnie Drive, Simcoe, ON	N/A	22,893.60	0.00	396.01	N/A
Western Avenue Pavillion	Western Avenue, Delhi, ON	N/A	256.90	0.00	4.44	N/A

EMS Bases and Associated Facilities

Facility	Address	Total Floor Area (ft ²)	Electricity (kWh)	Natural Gas (m ³)	GHG Emissions (kg CO _{2e})	Energy Intensity (kBTU / ft ²)
Community Services Building-Simcoe Base	95 Culver Street, Simcoe, ON	3,500	30,526.06	3,742.74	7,639.25	68.71
Delhi EMS Base	789 James Street, Delhi, ON	2,402	22,877.10	3,184.41	6,446.11	80.78
Fire/EMS Communications Tower	358 Concession 12 Townsend, Waterford, ON	50	11,327.60	0.00	195.94	386.50
Langton EMS Base / Fire Station	18 Queen Street, Langton, ON	3,860	20,035.00	3,565.29	7,120.62	64.54
Port Dover EMS Base	309 St. Patrick Street, Port Dover, ON	2,923	18,650.00	3,902.73	7,737.79	91.80
Port Rowan EMS Base	1417 Highway 59, Port Rowan, ON	4,800	30,149.30	2,576.83	5,417.50	40.99
Waterford EMS Base/ Fire Station	294 Main Street South, Waterford, ON	2,500	17123.03	1227.78	2,628.98	41.26

Fire Stations and Associated Facilities

Facility	Address	Total Floor Area (ft ²)	Electricity (kWh)	Natural Gas (m ³)	GHG Emissions (kg CO _{2e})	Energy Intensity (kBTU / ft ²)
Community Services Building-Simcoe Station	95 Culver Street, Simcoe, ON	8,500	74,127.43	9,089.51	18,552.33	68.71
Courtland Fire Station	272 Main Street of Courtland, Courtland, ON	4,464	15,613.30	8,822.03	17,031.94	83.92
Delhi Fire Station	104 Argyle Avenue, Delhi, ON	6,591	40,736.50	14,803.43	28,831.18	102.90
Fairground Fire Station	722 County Road 28, Fairground, ON	11,424	23,970.40	5,647.02	11,143.98	25.16
Fire/EMS Communications Tower	358 Concession 12 Townsend, Waterford, ON	50	5,663.80	0.00	97.97	386.50
Langton Fire Station / EMS Base	18 Queen Street, Langton, ON	1,533	13,880.37	1,415.96	2,930.43	64.54
Port Dover Fire Station	111 Nelson Street, Port Dover, ON	12,816	52,329.00	6,343.70	12,958.22	31.96
Port Rowan Fire Station	35 Erie Avenue, Port Rowan, ON	6,968	24,155.10	8,934.35	17,393.10	58.53
St. Williams Fire Station	180 Townline Street, St. Williams, ON	3,094	13,681.90	5,881.03	11,410.63	84.32
Teeterville Fire Station	186 Teeter Street, Teeterville, ON	12,918	37,015.20	9,018.77	17,775.95	35.21
Vittoria Fire Station	1375 Vittoria Road, Vittoria, ON	9,060	25,441.80	15,715.26	30,299.09	72.76
Waterford Fire Station / EMS Base	294 Main Street South, Waterford, ON	6,045	41,403.47	2,968.78	6,356.88	41.26

Long Term Care Facilities

Facility	Address	Total Floor Area (ft ²)	Electricity (kWh)	Natural Gas (m ³)	GHG Emissions (kg CO _{2e})	Energy Intensity (kBTU / ft ²)
Norview Lodge	44 Rob Blake Way, Simcoe, ON	123,845	2,285,192.10	388,401.04	777,491.23	177.19

Medical Centres

Facility	Address	Total Floor Area (ft ²)	Electricity (kWh)	Natural Gas (m ³)	GHG Emissions (kg CO _{2e})	Energy Intensity (kBTU / ft ²)
County Medical Centre	807 St. George Street, Port Dover, ON	7,474	79,081.10	4,041.38	9,046.57	55.80
Port Rowan Medical Centre	1035 Bay Street, Port Rowan, ON	6,200	41,332.20	4,089.86	8,485.70	46.62

Roads Operations and Storage Facilities

Facility	Address	Total Floor Area (ft ²)	Electricity (kWh)	Natural Gas (m ³)	GHG Emissions (kg CO ₂ e)	Energy Intensity (kBtu / ft ²)
Central Roads Operation Yard	340 Argyle Avenue, Delhi, ON	8,027	73,906.50	22,128.52	43,322.62	131.83
Courtland Operations Yard	4329 Highway 59, Courtland, ON	4,587	15,315.30	12,269.88	23,577.70	108.83
Dundurn Operations Pit	474 County Road 5, Dundurn, ON	1,000	3,262.00	0.00	56.43	11.13
Facilities Operations Building	591 Norfolk Street South, Simcoe, ON	9,676	50,491.40	19,009.54	36,991.53	89.37
Loader Storage Garage	3090 Highway 59, Langton, ON	N/A	4,110.90	0.00	71.11	N/A
Norfolk County Garage	568 Queensway West, Simcoe, ON	19,294	101,834.40	40,877.60	79,428.97	95.18
Oakwood Cemetery Building	55 Potts Road, Simcoe, ON	967	7,559.90	0.00	130.77	26.67
Parks Storage Building	177 Western Avenue, Delhi, ON	1,200	1,257.00	0.00	21.74	3.57
Parks Storage Building & Workshop	129 Pond Street, Simcoe, ON	3,254	5,298.10	8,853.25	16,912.82	104.66
Schellburg Offices & Roads Operations	8 Schellburg Avenue, Simcoe, ON	18,728	61,069.90	16,691.34	32,769.93	43.59
South Walsingham Storage Garage	2070 Main Street, Walsingham, ON	4,344	2,352.10	5,421.63	10,341.78	47.31
Villa Nova Roads Facility	1355 County Road 9, Villa Nova, ON	7,969	53,615.30	14,946.14	29,325.10	91.27
Walsh Dome	984 Charlotteville Road 7, Walsh, ON	N/A	2,774.90	0.00	48.00	N/A
West Roads Operations Yard	1630 County Road 45, Langton, ON	13,440	51,021.10	24,091.94	46,657.25	78.25

Roadway Lighting

Lighting Type	Address	Total # of Fixtures	Electricity (kWh)	Natural Gas (m ³)	GHG Emissions (kg CO ₂ e)	Energy Intensity (kBtu / Fixture)
Street Lighting	County-Wide	4,946	1,858,537.80	0.00	32,148.99	1,282.11
Traffic Lighting	County-Wide	420	271,247.60	0.00	4,692.04	2,203.56
Delhi Kinsmen Sign	Delhi, ON	N/A	4,152.00	0.00	71.82	14,166.62

Water Treatment

Facility	Address	Total Discharged (m ³)	Electricity (kWh)	Natural Gas (m ³)	GHG Emissions (kg CO ₂ e)	Energy Intensity (kBtu / m ³)
Cedar Street Buildings	396 Cedar Street, Simcoe, ON	604,485	418,750.00	9,489.60	25,273.78	2.94
Cedar Street Well	398 Cedar Street, Simcoe, ON	595,444	106,530.00	0.00	1,842.76	0.61

Facility	Address	Total Discharged (m ³)	Electricity (kWh)	Natural Gas (m ³)	GHG Emissions (kg CO ₂ e)	Energy Intensity (kBTU /m ³)
Chapel Street Well / Pump	260 Chapel Street, Simcoe, ON	590,087	16,342.50	0.00	282.69	0.09
Courtland Pump Station	329A Main Street of Courtland, Courtland, ON	83,709	84,304.80	0.00	1,458.30	3.44
Delhi Water Depot	80 Industrial Road, Delhi, ON	5,162	27,462.10	0.00	475.04	18.15
Delhi Water Tower	324 Argyle Avenue, Delhi, ON	N/A	40,731.70	0.00	704.58	N/A
Delhi Water Treatment Plant	391 Old Mill Road, Delhi, ON	39,670	59,351.30	7,352.09	14,995.62	11.86
First Avenue Depot	118 First Avenue West, Simcoe, ON	7,174	32,440.00	0.00	561.15	15.43
N/W Well #1 Pumphouse	171 14th Street West, Simcoe, ON	0	13,596.60	0.00	235.19	N/A
N/W Well #2 & #3 Pumphouses	231 14th Street West, Simcoe, ON	540,622	151,701.50	0.00	2,624.13	0.96
Port Dover Water Tower / Depot	Highway 6, Port Dover, ON	25,764	83,300.60	0.00	1,440.93	11.03
Port Dover Water Treatment Plant	603 Nelson Street, Port Dover, ON	846,726	287,519.90	0.00	4,973.52	1.16
Port Rowan Water Tower & Depot	1084 Bay Street, Port Rowan, ON	20,177	59,376.90	0.00	1,027.10	10.04
Port Rowan Water Treatment Plant	4 Archibald Street, Port Rowan, ON	335,123	345,403.00	0.00	5,974.78	3.52
Ronson Drain Pumphouse	1187 1st Concession, Courtland, ON	N/A	5,933.10	0.00	102.63	N/A
Simcoe Filter Plant	154 14th Street West, Simcoe, ON	528,582	280,592.00	15,699.82	34,683.34	2.89
Simcoe Pumping Station	157 Queensway West, Simcoe, ON	0	16,655.20	0.00	288.10	N/A
Simcoe Water Tower	296 Union Street, Simcoe, ON	N/A	14,239.90	0.00	246.32	N/A
St. Williams Booster Pump Station	180 Townline Street, St. Williams, ON	58,775	25,213.30	0.00	436.14	1.46
Stefek Well	Lot 19, Concession 13, Norfolk, ON	N/A	209.00	0.00	3.62	N/A
Water Storage Building	197 Queen Street East, St. Williams, ON	0	6,989.80	0.00	120.91	N/A
Waterford Water Depot	9 Deer Park Road, Waterford, ON	9,096	47,589.60	0.00	823.20	17.85
Waterford Water Plant	375 Thompson Road West, Waterford, ON	318,151	280,642.10	0.00	4,854.55	3.01
Waterford Water Tower	71 Bruce Street, Waterford, ON	N/A	4,344.80	0.00	75.16	N/A
Well No. 1 Pumphouse	2497 Windham W 1/4 Line Road, Delhi, ON	485,775	323,799.50	0.00	5,601.08	2.27
Well No. 2 Pumphouse	2529 Windham W 1/4 Line Road, Delhi, ON	0	497.00	0.00	8.60	N/A

Wastewater Treatment

Facility	Address	Total Discharged (m ³)	Electricity (kWh)	Natural Gas (m ³)	GHG Emissions (kg CO ₂ e)	Energy Intensity (kBTU /m ³)
Blueline Road Pumping Station	2270 Blueline Road, Waterford, ON	309,841	18,982.50	125.92	567.61	0.22
Decou Road Sewage Pumping Station	25 Decou Road, Simcoe, ON	42,508	10,580.80	129.07	428.26	0.96
Deer Park Road Pumping Station	28 Deer Park Road, Waterford, ON	538,024	50,392.40	230.13	1,308.93	0.34
Delhi Water Pollution Control Plant	244 Western Avenue, Delhi, ON	535,095	561,155.90	12,035.49	32,574.31	4.40
Donjon Boulevard Pump Station	80 Donjon Boulevard, Port Dover, ON	122,507	12,704.00	69.26	351.35	0.37
Ellis & Front Sewage Pump Station	Ellis Street & Front Road, Port Rowan, ON	227,751	43,361.70	283.79	1,289.27	0.70
Harbour Street Pump Station	40 Harbour Street, Port Dover, ON	79,537	10,420.10	0.00	180.25	0.45
Hillside Avenue Pumping Station	133 Hillside Avenue, Delhi, ON	1,454	539.60	0.00	9.33	1.27
Lynn Street Sewage Pumping Station	13 Lynn Street, Port Dover, ON	302	3,730.20	0.00	64.52	42.14
Main Street of Delhi Pumping Station	441 Main Street of Delhi, Delhi, ON	239,828	36,560.70	157.16	931.03	0.54
Mallard Walk Sewage Pumping Station	1 Mallard Walk, Port Rowan, ON	59,190	5,744.60	75.78	243.35	0.38
Nelson Street West Pump Station	328 Nelson Street, Port Dover, ON	225,878	25,463.60	0.00	440.47	0.38
Port Dover Water Pollution Control Plant	137 Hamilton Plank Road, Port Dover, ON	1,547,557	490,509.90	30,870.75	67,139.27	1.81
Port Rowan Water Pollution Control Plant	55 Hunter Drive North, Port Rowan, ON	220,487	717,997.60	0.00	12,419.92	11.11
Second Avenue Sewage Pumping Station	225 Second Avenue West, Simcoe, ON	63,149	11,650.40	0.00	201.53	0.63
Sewage Lift Station #3 Gen. Building	13 Grand Street, Port Dover, ON	103,935	20,729.40	0.00	358.58	0.68
Sewage Lift Station #7	38 Ryerse Crescent, Port Dover, ON	105,980	39,185.30	0.00	677.83	1.26
Simcoe Water Pollution Control Plant	16 Oakwood Avenue, Simcoe, ON	2,707,097	1,609,681.80	35,779.07	95,824.51	2.51
St. Michaels St. Sanitary Pumping Station	68 St. Michaels Street, Delhi, ON	19,780	13,587.70	176.29	569.99	2.67

Facility	Address	Total Discharged (m³)	Electricity (kWh)	Natural Gas (m³)	GHG Emissions (kg CO₂ e)	Energy Intensity (kBTU / m³)
St. Patrick Street Sewage Pumping Station	4 Bridge Street, Port Dover, ON	1,317,129	121,151.70	56.67	2,203.36	0.32
Talbot Road Pumping Station	260 Talbot Street, Delhi, ON	32,474	8,318.40	144.81	419.03	1.04
Talbot Street- Sewage Lift Station	302 Talbot Street North, Simcoe, ON	149,431	17,836.50	135.37	565.74	0.44
Waterford Water Pollution Control Plant	672 Concession 8 Townsend, Waterford, ON	431,786	112,257.00	0.00	1,941.82	0.89
Western Avenue Sewage Pumping Station	170 Western Avenue, Delhi, ON	14,513	9,462.50	340.00	809.68	3.08

Solid Waste Transfer Stations

Facility	Address	Total Floor Area (ft²)	Electricity (kWh)	Natural Gas (m³)	GHG Emissions (kg CO₂ e)	Energy Intensity (kBTU / ft²)
Simcoe Transfer Station	164-14th Street West, Simcoe, ON	400	11,195.90	0.00	193.67	95.50
South Walsingham Transfer Station	1180 3rd Concession, Walsingham, ON	450	12,283.50	0.00	212.48	93.14

Appendix B – Definitions

“**Carbon Sequestration**” is the removing of carbon dioxide from the atmosphere through natural (trees or plants) or artificial processes.

“**Cooling Degree Days (CDD)**” is a measurement designed to reflect the demand of energy to cool a building. This report uses CDD figures from the Government of Canada’s Climate database for the Delhi Weather Station. CDD for a given day is the number of degrees Celsius that the daily mean temperature is greater than 18°C, e.g. the mean temperature on August 1st, 2019 was 19.5°C, therefore the CDD for this day =1.5.

“**Energy Use Intensity (kBTU/ft²)**” is a building’s annual energy use in kBTU per unit of gross building area in square feet.

“**kBTU**” is a common unit of energy. 1 kWh of electricity is equal to 3.412 kBTU. 1 m³ of natural gas is equal to 36.425 kBTU. 1L of diesel is equal to 36.301 kBTU. 1L of gasoline is equal to 31.794 kBTU.

“**GHG (Greenhouse Gases)**” is the emission of various chemicals and gases into the earth’s atmosphere that contribute to the greenhouse effect.

“**Heating Degree Days (HDD)**” is a measurement designed to reflect the demand of energy to heat a building. This report uses HDD figures from the Government of Canada’s Climate database for the Delhi Weather Station. HDD for a given day is the number of degrees Celsius that the daily mean temperature is less than 18°C, e.g. the mean temperature on January 1st, 2019 was -6.8°C, therefore the HDD for this day =24.8.

“**ekWh (equivalent kilowatt-hour)**” is a unit of energy to compare different energy sources. The ekWh uses the most commonly used electricity unit (kWh) as its base for comparison. 1 kWh of electricity is equal to 1 ekWh. 1 m³ of natural gas is equal to 10.6 ekWh.