



The Corporation of the Town of Milton Green
Innovation Plan

-
2018 Corporation Energy Plan





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Section I Milton's Commitment to Responsible Energy Management and Green Innovation

Introduction and Intent of the Plan

The Town of Milton is one of the fastest growing municipalities in Canada, well positioned for an expanding population and substantial economic growth. To continue to serve this community, the Town of Milton must grow alongside it, supporting economic development while ensuring that Milton remains a healthy and vibrant place to live and work. Now more than ever, we are aware of the impacts of our energy consumption, and the importance of ensuring responsible development and operation. By investing now in understanding our energy uses and emissions, there are incredible opportunities for Milton to plan for healthy future and emerge as a leader in this growing field. Now is the time to take advantage of those opportunities.

The Milton Green Innovation Plan is the flagship program for the Town's commitment to responsible energy management and development. As part of this program, the Town will create a baseline review of energy usage and emissions from the Town's assets and the community at large, and develop an action plan to ensure their responsible management. This document, the Corporation Energy Plan, will look specifically at the assets of the Corporation of the Town of Milton, while its companion document, the Community Energy Plan, will look to the broader community. These documents should be understood to function together to achieve the goals of the Milton Green Innovation Plan.

This Plan will provide an overview of the Corporate assets of the Town of Milton, looking at energy trend data and setting a baseline to measure against future performance, and then present a plan on how energy and emissions will be managed over the next 5-year period. As municipal facilities make up a large portion of the Town's assets by energy usage, and can present significant potential reduction solutions, they will be given the most focus in this document. Each facility will be presented in a fact sheet format, showing energy trends, current and future management plans, and a brief description of its operation. A description of our goals across this five-year plan and into the future, and how those goals will be reached, will also be discussed.

Milton is a place for happy and healthy growth and development, and with this Plan we hope to ensure that it will remain so for many years into the future.



Vision and Goals

Our vision for Milton is a strong and prosperous community that has laid the foundations of its development by focusing on the triple bottom line; **Economy, Society and Environment.**

As one of the fastest growing municipalities in Canada with significant potential for continuing development, it is crucial that the Milton Green Innovation Plan address both the economic opportunities and challenges facing us. Energy conservation and responsible management have the potential to provide significant economic benefits to the town and its residents through managing energy costs and mitigating future expenses. However, the opportunity costs and budgetary planning requirements can be significant challenges. The development of our Corporate and Community Energy Plans, outlining where we are today and the opportunities that are ahead of us, is an important part in overcoming those challenges.

Supporting a happy, healthy and prosperous community by providing access to exceptional public facilities has always been one of our most important duties. As Milton's community continues to grow, this creates added pressure on our existing public facilities and community centres, and the drive to expand to keep pace with our town's growth. Managing this intensification of use and expansion will be a critical challenge, however, to the goal of controlling and reducing GHGs. Understanding the sources of emissions, separating areas of improvement from operational requirements, and directing new development will play an ever-increasing role in continuing to provide the services the community of Milton has come to expect and deserve.





To ensure our community remains a vibrant and healthy place to develop, now and in the future, we understand the importance of responsible energy management in all facets of our community.

The Milton Green Innovation Plan is framed around several key goals;

1. Update the Corporation Conservation and Demand Management Plan created in 2012, reflecting an up to date baseline for legacy buildings, proactively planning for new corporate buildings, and expanding to categories such as transportation and corporate fleets.
2. Create a Community Plan including regional, commercial, residential and institutional energy analysis.
3. Engage a wide stakeholder group to develop and advance the Community Plan, with effective engagement led through a Steering Committee, Advisory Groups and public engagement.
4. Explore the potential for Deep Green approaches to exciting new developments such as the Milton Education Village.
5. Maintain sustaining governance and effective implementation of the Plan through the Steering Committee and Advisory Groups.

To achieve these goals, our Corporation and Community Energy Plans have been developed under the Milton Green Innovation Plan.

[Understanding Milton's Role in Energy Leadership](#)

Responsibly managing energy usage while ensuring economic growth is a challenge, yet it is one that the Town of Milton feels confident in facing. Developing and implementing an effective plan will require the collaboration and partnership of key stakeholders across the community. The Town has worked hard to build positive relationships with those stakeholders, and will be taking on a leadership role in bringing them together.

As we set our goals for the Milton Green Innovation Plan, we want to ensure that we are ready to commit the Corporation Plan to the same targets we set for our Community Plan. Taking a role in energy leadership means more than simply gathering the right people, it is committing to meaningful action and then following through on that commitment.



The Green Energy Act

The Province of Ontario has developed the Green Energy Act (GEA) as “a mechanism to expand renewable energy generation, encourage energy conservation and promote the creation of clean energy jobs” (Ministry of Energy, 2012). The GEA requires public agencies, including municipalities, to:

- Report annually on energy use and GHG emissions and post that information online; and
- Develop five-year energy conservation plans and post those plans online.

The Town of Milton has reported its energy use and GHG emissions as required under the GEA, and the Corporation Energy Plan in conjunction with the Community Energy Plan and regular reporting shall serve as the five-year conservation plan.



Section II Understanding Energy and Emissions

The energy we use in the every-day operation of our buildings and facilities is one of the most significant sources of GHG emissions that we produce. In Ontario, our energy principally comes in two sources, electricity and natural gas. By tracking our energy use, and understanding how it can be reduced or made more efficient, we can best manage and control our GHG emissions.

Emissions Conversion Factors

An equivalent greenhouse gas emissions conversion factor is used to convert various fuels consumed into an equivalent amount of GHG's emitted. The two main fuels focused on are electricity and natural gas.

Natural Gas

Natural gas conversion factors for converting m³ to GHGe (in metric tons of CO₂) is a fairly consistent value and is shown below (1.899 kg CO₂e / m³).

Fuel	Emission Factor
Stationary sources	
Electricity	0.043 kg CO ₂ e / kWh
Natural gas	1.899 kg CO ₂ e / m ³
Propane	1.548 kg CO ₂ e / L
Heating oil	2.755 kg CO ₂ e / L
Mobile sources	
Diesel	2.754 kg CO ₂ e / L
Gasoline	2.462 kg CO ₂ e / L

Figure 1: SOURCE: Municipal GHG Challenge Fund Program Guide (from the CCAP)

Electricity

Electricity GHGe factors have been variable in history and rely heavily on how the electricity is generated. In the past, Ontario used coal-fired generation to generate electricity, which contributed immensely to GHG emissions. More recently, coal has been phased out, and the only generation that contributes to GHGs is the natural gas peaking plants used to add power to the grid during peak demand times (typically 2pm – 9pm on the hottest and coldest days of the year). The following chart shows historical conversion factors used for both electricity and gas. Notice that gas has remained unchanged, but electricity has fluctuations.



<i>Converting each fuel type to equivalent Greenhouse Gas Emissions (in kg CO₂e)</i>						
	2012	2013	2014	2015	2016	2017
Electricity (kWh)	0.1034	0.0847	0.0500	0.0430	0.0430	0.0430
Natural Gas (m³)	1.8906	1.8994	1.8994	1.8994	1.8994	1.8994

Electricity Generation 2012 - 2014

The GHGe conversion numbers steadily decreased from 2012 to 2014 due to Ontario phasing out coal generation from the grid. GHG emissions were cut in half in 2 years by removing coal generation. The exact coal removal phases are explained below.

Total coal-fired capacity at year end

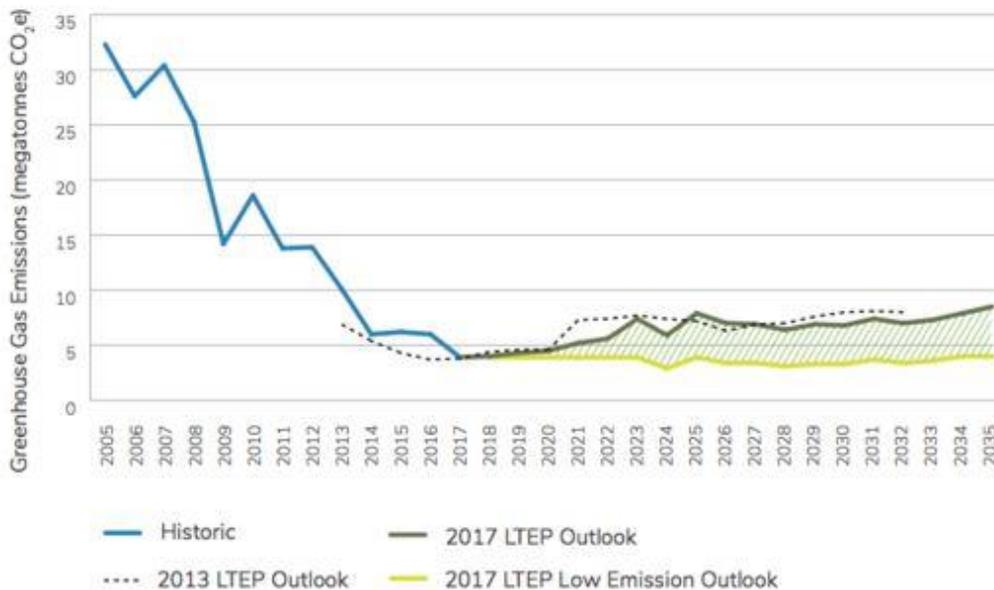
Year	2003	2005	2010	2011	2012	2013	2014
Megawatts (MW)	7587	6437	4487	3507	3296	306	0

The coal-fired capacity in Ontario was reduced to zero in 2014.

Figure 2: SOURCE: <https://www.ontario.ca/page/end-coal>

Electricity Generation 2014 – 2023 and Beyond

The figure below provides the outlook over the next 20 years.



Source: IESO, Environment Canada and Climate Change



Figure 1: SOURCE: Climate Change Action Plan page 109

From 2018 to 2020 electricity generation will stay fairly consistent, with only marginal increases in GHG emission from electricity generation. This marginal increase may be from the overall Ontario demand increasing, which will cause for more peaking plants to be running.

In 2020, a large increase in GHG emissions from electricity generation is expected. This can mainly be attributed to the expected Pickering nuclear station shut down. When the station shuts down, more natural gas fired generation plants are assumed to be required to make up for the loss in power generation. The increase is essentially double the GHG emissions from 2018 to 2023. After 2023, the higher GHG emissions are expected to stay where they are for the next 10 years.

Uncertainty in Grid

The figure below just shows the “uncertainty” in our future grid. The green lines show expiring contracts, which mean the generation source needs to renew the contract, or a different generation technology/strategy will need to make up for the shortage in supply. The uncertainty in future electricity supply also contributes to uncertainty in GHG emissions from electricity generation because we don’t know for sure how the electricity will be generated.

Figure 12: Outlook for Installed Capacity to 2035

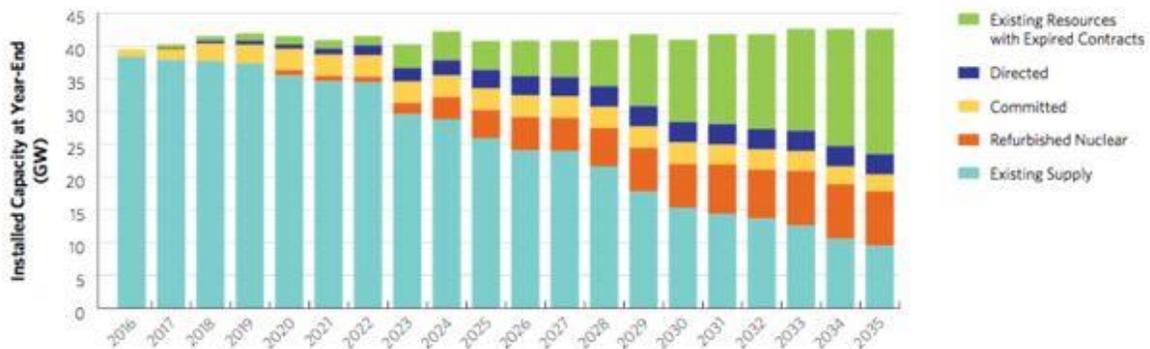


Figure 4: SOURCE: IESO Ontario Planning Outlook Page 9

Corporate Facilities Overview

- This section will feature a one-page informational overview of each of the town’s corporate facilities
- Each overview will contain
 - Descriptive paragraph
 - Broad view chart of energy use by year
 - Graphic representation
 - Quick descriptions of what current and future actions are being undertaken to reduce energy usage
- Each facility sheet should be a self-contained document that could be posted at the facility or used elsewhere



Municipal Facilities

- Town Hall
- Annex Building
- Civic Operations Centre



Activity Centres

- Milton Sports Centre
- John Tonelli Sports Centre
- Mattamy National Cycling Centre
- Milton Memorial Arena
- Nassagaweya Tennis Centre & Community Hall
- Milton Leisure Centre
- Rotary Park Outdoor Pool



Community Centres

- FirstOntario Arts Centre Milton
- Nassagaweya Community Centre
- Milton Seniors’ Activity Centre
- Beaty Branch Public Library
- Hugh Foster Hall
- Chris Hadfield Building



Fire Stations

- Fire Station Headquarters
- Fire Station No. 1
- Fire Station No. 2
- Fire Station No. 4



MILTON Town Hall

150 Mary Street
Milton, Ontario

Milton Town Hall comprises the historical stone-exterior Town Hall building constructed in the 1800's, as well as a modern 50,000 square-foot addition constructed in 2009 and designed to LEED Certified standards. The two structures are connected by a glass walkway, which houses the Milton Walk of Fame.



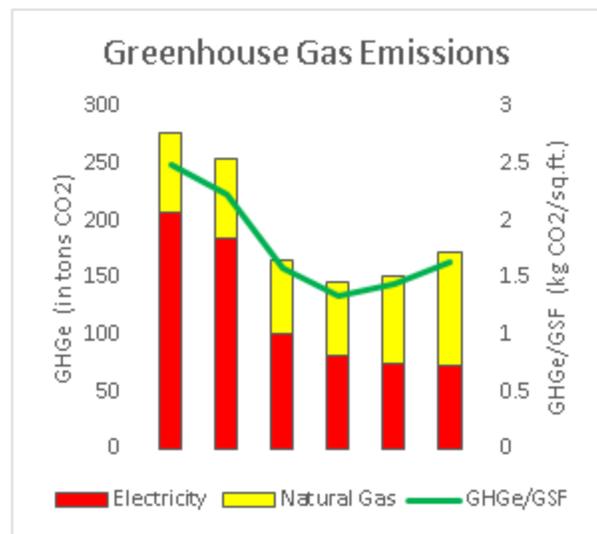
Numerous energy efficiency measures are present in the facility including low flow fixtures, energy efficient lighting and occupancy controls. The new facility is open to the public from 8:30 AM – 4:30 PM, Monday to Friday.

	2012	2013	2014	2015	2016*	2017*	2018	2019	2020
GSF	105,194	105,194	105,194	105,194	105,194	105,194			
Electricity (kWh)	2,006,206	2,175,881	2,027,387	1,908,290	1,871,583	1,809,132			
Natural Gas (m³)	36,629	36,749	34,249	33,723	40,239	52,688			
GHGe (tons CO₂)	261.93	234.87	166.42	141.38	151.29	172.44			

*unofficial data

WHAT WE'RE DOING NOW

- Ongoing improvements to control systems and related mechanical equipment to maintain operating efficiency.





Annex Building

555 Industrial Drive
Milton, Ontario

The Town Hall Annex Building was constructed in 1984. It provides the town with additional administrative office space during periods of facility transition, as well as offering extra space as needed. The three-floor facility consists primarily of office and meeting space.



	2012	2013	2014	2015	2016*	2017*	2018	2019	2020
GSF	42,600	42,600	42,600	42,600	42,600	42,600			
Electricity (kWh)	725,497	648,992	698,250	793,062	884,931	819,620			
Natural Gas (m³)	29,220	31,291	44,556	40,744	36,366	35,501			
GHGe (tons CO₂)	124.92	108.49	119.54	109.19	104.47	100.21			

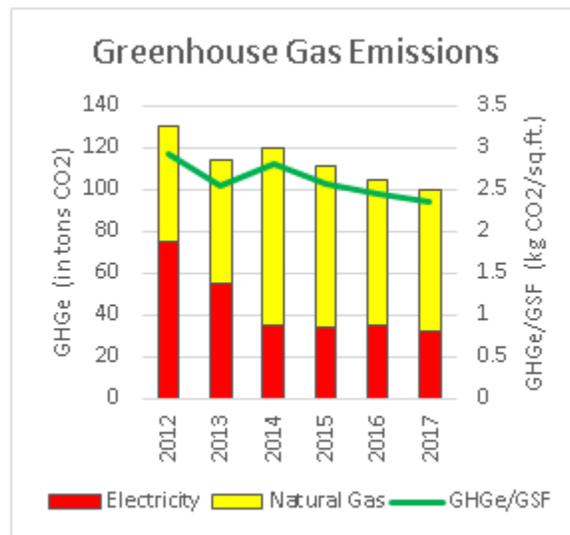
*unofficial data

WHAT WE'RE DOING NOW

- In 2017, structural repairs were made to improve the energy envelope of the building, including new insulation and cladding.

OUR PLANS FOR THE FUTURE

- In 2018, new HVAC and building controls will be installed.





MILTON

FirstOntario Arts Centre Milton

1010 Main Street East
Milton, Ontario

The FirstOntario Arts Centre Milton is public facility operating year-round. It has multiple spaces with different usages, a 500-seat theatre, Main Library Branch, auditorium, art gallery in the main lobby and two studios and meeting rooms on second floor.



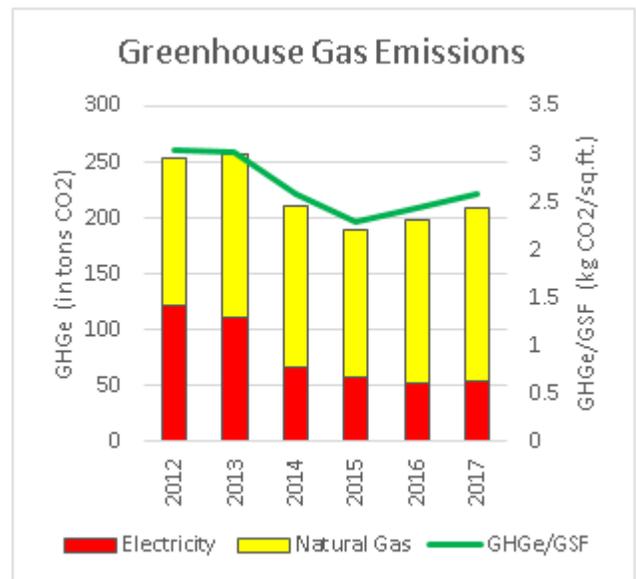
The facility is a multiple story building constructed on grade. Designed to LEED Certified standards, numerous energy efficiency measures are present in the facility including low flow fixtures, energy efficient lighting and occupancy controls.

	2012	2013	2014	2015	2016*	2017*	2018	2019	2020
GSF	81,000	81,000	81,000	81,000	81,000	81,000			
Electricity (kWh)	1,174,279	1,319,950	1,325,965	1,331,349	1,311,522	1,352,638			
Natural Gas (m³)	70,307	76,700	75,661	69,589	76,517	81,419			
GHGe (tons CO₂)	245.70	245.32	210.01	185.54	197.79	208.75			

*unofficial data

WHAT WE'RE DOING NOW

- Solar panels have been installed on the roof, generating renewable energy.
- Internal lights have been converted to energy-efficient LEDs.
- A highly reflective roof membrane has been installed, reducing the heat island effect.





MILTON

Milton Sports Centre

605 Santa Maria Blvd,
Milton, Ontario

Milton Sports Centre is a year-round multi-activity complex housing four ice pads, a gymnasium, elevated walking track, fitness studio, indoor pool, meeting rooms and other multi-use rooms.



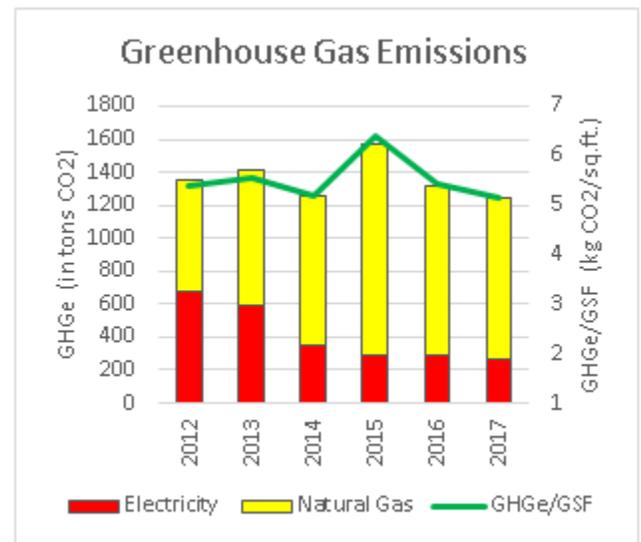
Designed to LEED Certified standards, numerous energy efficiency measures are present in the facility including low flow fixtures, energy efficient lighting, occupancy controls and geothermal heat recovery system.

	2012	2013	2014	2015	2016*	2017*	2018	2019	2020
GSF	241,995	241,995	241,995	241,995	241,995	241,995			
Electricity (kWh)	6,586,810	7,052,406	7,108,095	6,732,857	7,245,771	6,785,924			
Natural Gas (m³)	352,909	429,068	474,504	671,937	539,740	514,143			
GHGe (tons CO₂)	1299.82	1347.26	1256.66	1543.37	1314.99	1247.98			

*unofficial data

WHAT WE'RE DOING NOW

- Ice making equipment is being operated through a geo-thermal system.
- LED lighting has been installed in two of the arenas.
- Solar panels have been installed on two of the arena roofs.
- Rain water is recycled through a gray water recovery system.



OUR PLANS FOR THE FUTURE

- In 2018, in partnership with Milton Hydro, a Combined Heat and Power System will supply electricity and heat.
- Absorption chillers will be introduced to absorb waste heat, providing cooling and reducing electrical demand.
- Additional LED conversions are planned for the remaining arenas and pool.



John Tonelli Sports Centre

217 Laurier Ave.
Milton, Ontario



John Tonelli Sports Centre consists of a single ice pad operational approximately 8 months of the year and is generally closed during the summer months. The facility is typically occupied during ice season between 3pm-11:30pm Monday through Friday and 6am-11:30pm on the weekends. Sections of the facility were upgraded in 2006 including placing occupancy sensors on washrooms and lockers. T5 lighting has been retrofitted in the arena with 4-stage dimming capabilities based on building occupancy.

	2012	2013	2014	2015	2016	2017*	2018	2019	2020
GSF	36,000	36,000	36,000	36,000	36,000	36,000			
Electricity (kWh)	465,530	517,112	548,350	544,356	589,224	590,269			
Natural Gas (m³)	45,791	54,455	58,601	56,973	52,721	48,570			
GHGe (tons CO₂)	131.28	142.26	138.72	129.79	123.70	115.86			

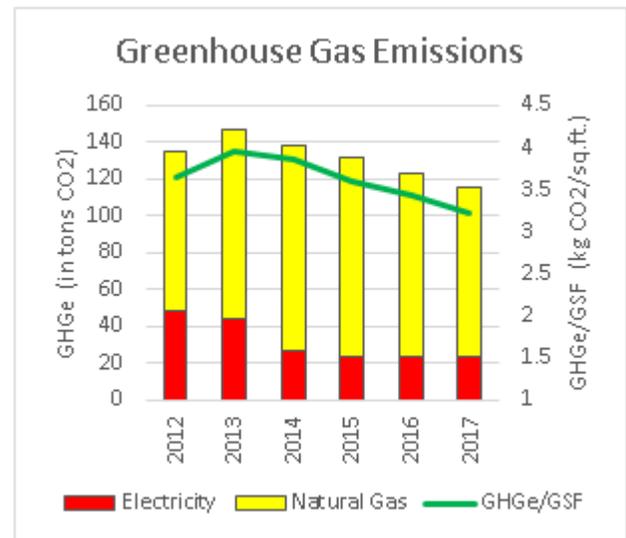
*unofficial data

WHAT WE'RE DOING NOW

- In 2017, in partnership with Milton Hydro, solar panels have been installed on the roof.

OUR PLANS FOR THE FUTURE

- Electric ice resurfacers are being examined for feasibility.
- LED lighting is planned for installation within the arena.





MILTON

Mattamy National Cycling Centre

2015 Pan Am Boulevard
Milton, Ontario

The Mattamy National Cycling Centre is a combination of a high-performance indoor track cycling facility and a community recreation facility designed to LEED Certified Standards. The facility features a 250-metre timber track designed to meet requirements set by the International Cycling Union for international competitions. The Centre includes a world class, 250-metre cycling track, as well as community sport and recreation facilities:



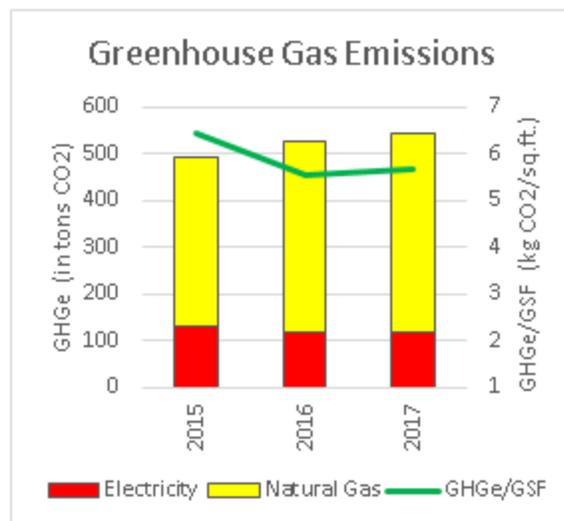
- Gymnasium courts 300-metre indoor walking/running track
- Fitness centre including studio
- Bike Shop (to come)
- Bike Storage
- Meeting Rooms

	2012	2013	2014	2015	2016*	2017*	2018	2019	2020
GSF	0	0	0	95,368	95,368	95,368			
Electricity (kWh)	0	0	491,023	3,020,339	2,920,078	2,997,494			
Natural Gas (m³)	0	0	0	192,368	216,262	222,600			
GHGe (tons CO₂)	0.00	0.00	24.55	614.06	527.56	542.70			

*unofficial data

WHAT WE'RE DOING NOW

- Fully automated building and lighting controls have been installed, scheduled to occupancy and programming needs.
- Daylight harvesting controls are in place to control when and where natural light is allowed in.
- All exterior lighting is using LEDs for high efficiency.
- Highly reflective roof membrane reduces heat islanding.
- Electric vehicle chargers have been installed.





MILTON

Milton Memorial Arena

77 Thompson Road
Milton, Ontario

Milton Memorial Arena is an all year facility and is accessible by the public, consisting of a single ice pad operating approximately eight months of the year, and acts as a multipurpose arena the during the summer months. A Lions Club Hall located above the main foyer contains a large banquet hall and adjoining kitchen. The arena is heavily used during ice season between 3:00 PM – 11:00 PM Monday through Friday and 6:00 AM – 12:00 AM on the weekends.



	2012	2013	2014	2015	2016*	2017*	2018	2019	2020
GSF	38,000	38,000	38,000	38,000	38,000	38,000			
Electricity (kWh)	572,338	586,762	593,105	543,133	626,677	611,489			
Natural Gas (m³)	70,706	75,048	82,758	79,735	74,186	76,956			
GHGe (tons CO₂)	188.65	186.49	186.84	172.77	165.97	170.63			

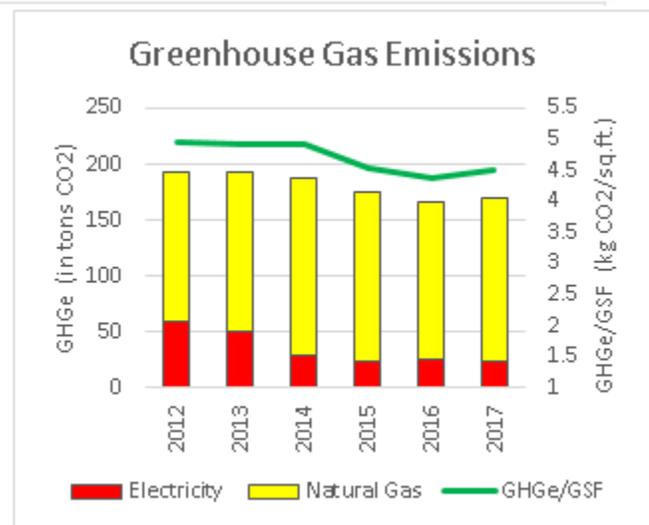
*unofficial data

WHAT WE'RE DOING NOW

- Arena lighting has been converted to LEDs.
- Kitchen equipment has been converted from natural gas to electric.

OUR PLANS FOR THE FUTURE

- Electric ice resurfacers are being investigated for feasibility.





Nassagaweya Tennis Centre & Community Hall

Guelph Line & Campbellville
Milton, Ontario

Completed in 2011, this mixed-use facility features a community hall, meeting room and kitchen tennis courts and clubhouse. The tennis court lights and clubhouse are separately metered. Designed to LEED Certified standards, numerous energy efficiency measures are present in the facility including low flow fixtures, energy efficient lighting and occupancy controls.

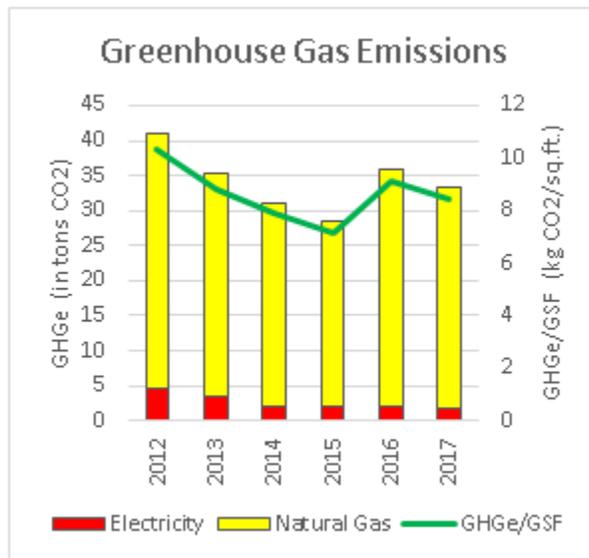


	2012	2013	2014	2015	2016*	2017*	2018	2019	2020
GSF	3,929	3,929	3,929	3,929	3,929	3,929			
Electricity (kWh)	43,889	41,515	43,596	45,186	48,714	46,892			
Natural Gas (m³)	19,245	16,691	15,159	13,916	17,808	16,498			
GHGe (tons CO₂)	40.60	34.71	30.97	28.14	35.77	33.21			

*unofficial data

WHAT WE'RE DOING NOW

- Building control systems and mechanical equipment is being improved to maintain ongoing operating efficiency.





MILTON

2005 Cameron Drive
Milton, Ontario

Nassagaweya Community Centre

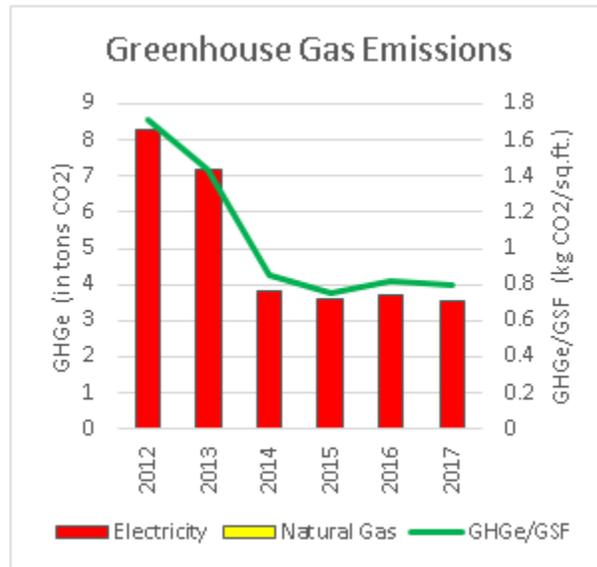
The Nassagaweya Community Centre is a year-round facility, serving many uses within the community. The facility, built in 1987, contains a main hall with a capacity of approximately 160 people, a full kitchen, meeting room and storage room. The hall is a community rental space only; as such it is not open to the public and is only open when rented.



	2012	2013	2014	2015	2016*	2017*	2018	2019	2020
GSF	4,500	4,500	4,500	4,500	4,500	4,500			
Electricity (kWh)	80,018	84,870	76,446	83,795	92,580	89,188			
Natural Gas (m³)	0	0	0	0	0	0			
GHGe (tons CO₂)	7.68	6.45	3.82	3.40	3.70	3.57			

*unofficial data

WHAT WE'RE DOING NOW





MILTON

1100 Main Street
Milton, Ontario

Milton Leisure Centre

Milton Leisure Centre is a year-round multi-activity complex with facilities including a gymnasium, multiple swimming pools, fitness and weight studios, sauna and childcare service. The facility is open to the general public and can also be booked for schedule events.



	2012	2013	2014	2015	2016*	2017*	2018	2019	2020
GSF	49,700	49,700	49,700	49,700	49,700	49,700			
Electricity (kWh)	1,486,732	1,608,537	1,502,464	1,429,710	1,602,121	1,518,881			
Natural Gas (m³)	223,897	233,026	221,922	219,144	205,195	224,487			
GHGe (tons CO₂)	566.09	562.82	496.63	472.28	453.82	487.14			

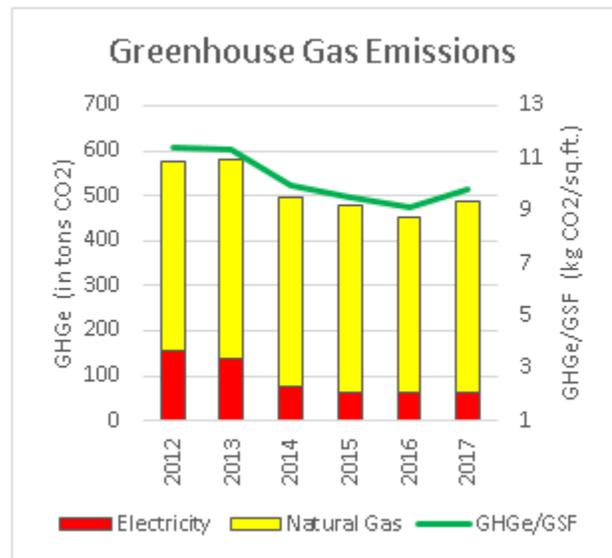
*unofficial data

WHAT WE'RE DOING NOW

- LED lighting was installed in the gym in 2016.
- HVAC replacements in 2017.

WHAT WE'RE DOING NOW

- LED lighting is planned for the pool.





Rotary Park Outdoor Pool

1 Garden Lane
Milton, Ontario

This facility consists of a public outdoor swimming pool combined with a splash pad operating 9 AM – 9 PM, seven days a week between late June and Labour Day (early September). A structure with wash and change rooms, storage rooms and a mechanical room containing water pumps, heater and filters is located at the facility. During the non-operational season, all loads including pumps and lighting at the facility are turned off.

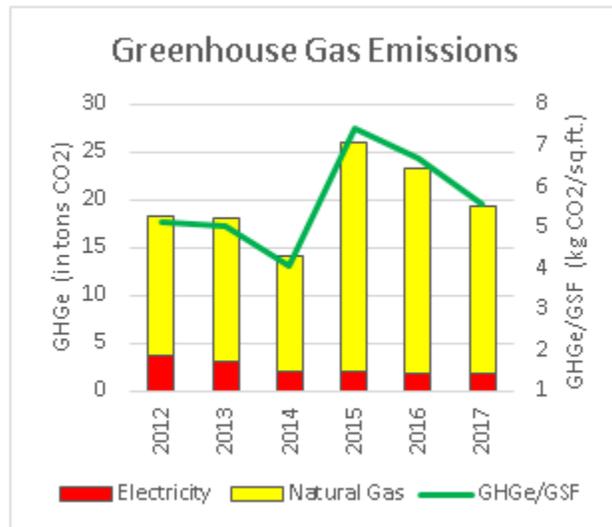


	2012	2013	2014	2015	2016*	2017*	2018	2019	2020
GSF	3,500	3,500	3,500	3,500	3,500	3,500			
Electricity (kWh)	35,672	35,545	39,861	46,873	45,085	43,747			
Natural Gas (m³)	7,717	7,918	6,408	12,686	11,370	9,293			
GHGe (tons CO₂)	18.02	17.67	14.16	25.89	23.40	19.40			

*unofficial data

OUR PLANS FOR THE FUTURE

- Boiler replacement is scheduled for 2018, improving operating performance.





Milton Seniors' Activity Centre

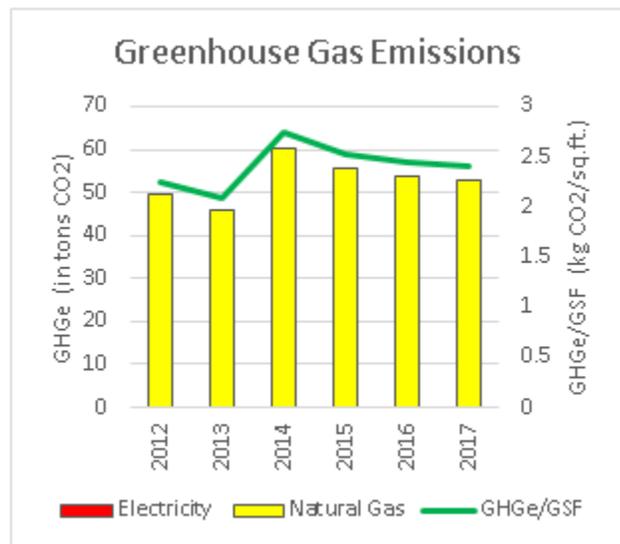
500 Childs Dr.
Milton, Ontario

The Milton Seniors' Activity Centre is leased from Halton Region for use as a recreational facility for adults over 55 years of age. The facility offers programs, clubs, and support of varying descriptions designed to keep participants engaged in the community and ensure a high standard of life. In addition to the planned activities, the centre offers rentable hall space for private functions.



	2012	2013	2014	2015	2016*	2017*	2018	2019	2020
GSF	22,000	22,000	22,000	22,000	22,000	22,000			
Electricity (kWh)	0	0	0	0	0	0			
Natural Gas (m³)	26,111	24,247	31,679	29,369	28,406	27,851			
GHGe (tons CO₂)	49.37	45.84	60.17	55.53	53.95	52.90			

*unofficial data





Sherwood Community Centre

Main Street and Tremaine Rd.

This new facility, planned to open in spring 2019, will feature a flexible multi-use design to accommodate a wide range of activities and multi-generational spaces.



	2012	2013	2014	2015	2016	2017	2018	2019	2020
GSF									
Electricity									
Natural Gas									
GHG									



Beaty Branch Public Library

945 Fourth Line
Milton, Ontario



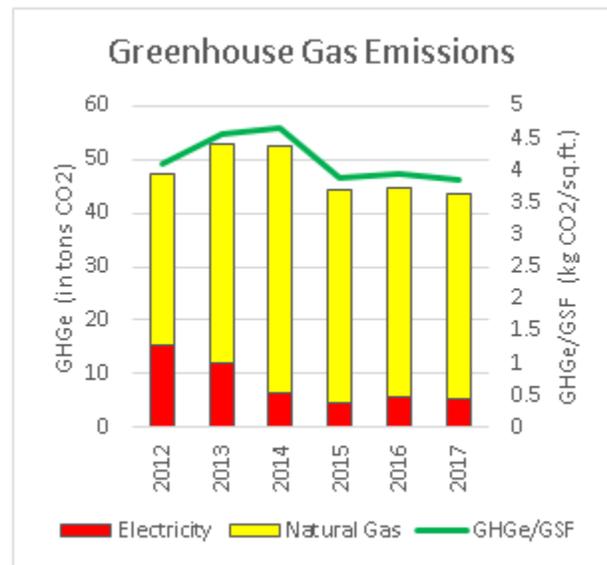
The Beaty Branch public library is an 11,300 ft² (1,050 m²) facility housing over 42,000 items of various media. The LEED Silver Certified building has been open to the public since November 17, 2009. The one-storey library is located adjacent a storm water channel and green space.

	2012	2013	2014	2015	2016*	2017*	2018	2019	2020
GSF	11,300	11,300	11,300	11,300	11,300	11,300			
Electricity (kWh)	147,723	141,714	131,637	106,948	142,833	130,103			
Natural Gas (m³)	17,008	21,583	24,258	20,935	20,551	20,158			
GHGe (tons CO₂)	46.34	51.58	52.66	43.92	44.75	43.49			

*unofficial data

WHAT WE'RE DOING NOW

- Ongoing improvements to control systems and related mechanical equipment to maintain operating efficiency.





Hugh Foster Hall

141 King Street
Milton, Ontario



Hugh Foster Hall is an all year facility. The building is located on the same property as the Town Hall. The building is a single storey with a basement. It should be noted the basement is not accessible to the general public.

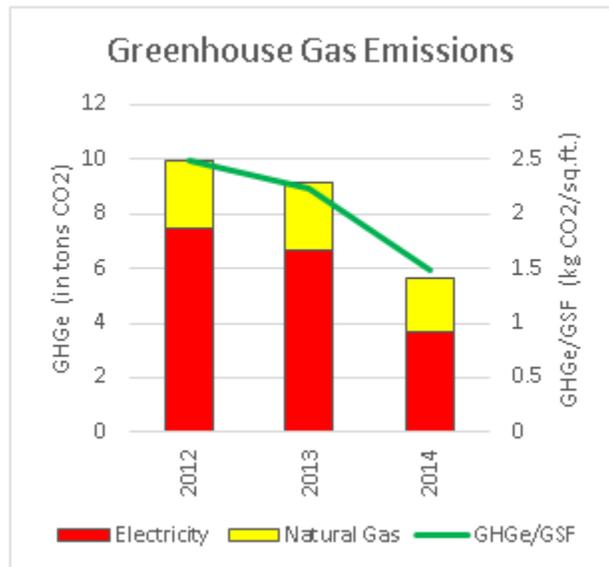
The facility consists of a meeting hall, kitchen and support spaces. The facility is a community rental space only; as such it is not open to the public and is only open when rented.

	2012	2013	2014	2015	2016*	2017*	2018	2019	2020
GSF	3,800	3,800	3,800	0	0	0			
Electricity (kWh)	72,223	78,593	73,598	0	0	0			
Natural Gas (m³)	1,319	1,327	1,027	0	0	0			
GHGe (tons CO₂)	9.43	8.48	5.63	0.00	0.00	0.00			

*unofficial data

WHAT WE'RE DOING NOW

- Ongoing improvements to control systems and related mechanical equipment to maintain operating efficiency.





Chris Hadfield Building

1 Chris Hadfield Way
Milton, Ontario

Chris Hadfield Building is a heritage listed building, originally constructed in 1884 but relocated to its current location in 1973. The building is currently leased.

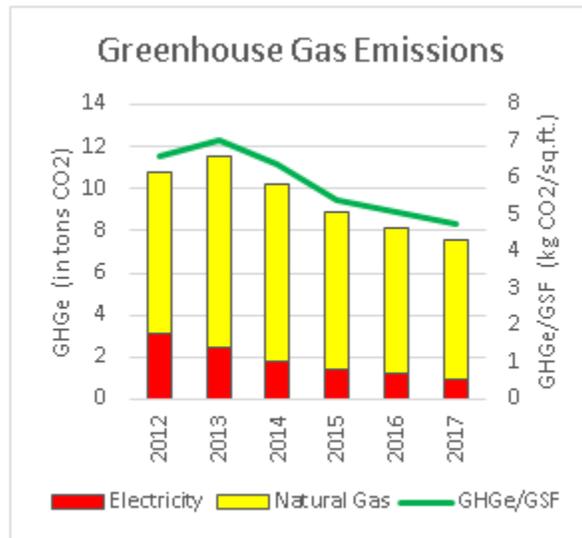


	2012	2013	2014	2015	2016*	2017*	2018	2019	2020
GSF	1,600	1,600	1,600	1,600	1,600	1,600			
Electricity (kWh)	29,825	28,868	36,579	33,346	31,153	24,348			
Natural Gas (m³)	4,080	4,764	4,418	3,910	3,620	3,491			
GHGe (tons CO₂)	10.58	11.20	10.22	8.68	8.12	7.61			

*unofficial data

WHAT WE'RE DOING NOW

- Ongoing improvements to control systems and related mechanical equipment to maintain operating efficiency.





MILTON

Fire Station Headquarters

610 Savoline Boulevard
Milton, Ontario

Fire Station Headquarters, also called Station No. 3, is the newest fire department location, covering 15,000 square feet. It is the current home of the Fire Administration, Fire Prevention/Public Education and Support Services divisions, and includes a new state of the art communications centre.

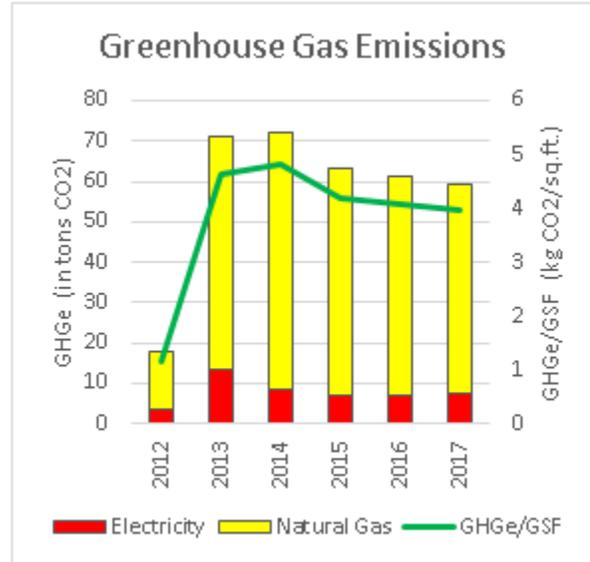


	2012	2013	2014	2015	2016*	2017*	2018	2019	2020
GSF	15,000	15,000	15,000	15,000	15,000	15,000			
Electricity (kWh)	36,526	160,770	166,846	167,742	180,732	194,112			
Natural Gas (m³)	7,441	30,278	33,672	29,550	28,435	27,125			
GHGe (tons CO₂)	17.58	69.46	72.30	62.67	61.24	59.28			

*unofficial data

WHAT WE'RE DOING NOW

- Ongoing improvements to control systems and related mechanical equipment to maintain operating efficiency.





Fire Station No. 1

405 Steeles Ave
Milton, Ontario

The Central Fire Station was originally built in 1977 and has previously served as a fire station, office headquarters and dispatch center. In November 2012, full-time occupants were relocated to the newly constructed Fire Station No. 3. This facility now functions primarily as the Training Centre for suppression staff.



Training sessions are scheduled throughout the year. Seasonal changes will have occupants training outside the facility during warmer months and within the truck bay during cooler periods. Classroom learning will take place inside year-round.

This facility is not generally open to the general public and does not house any sub-lease space.

	2012	2013	2014	2015	2016*	2017*	2018	2019	2020
GSF	21,650	21,650	21,650	21,650	21,650	21,650			
Electricity (kWh)	195,449	150,691	153,737	148,103	133,109	135,969			
Natural Gas (m³)	26,924	35,404	38,085	35,146	29,896	31,396			
GHGe (tons CO₂)	69.67	78.39	80.02	72.45	62.11	65.07			

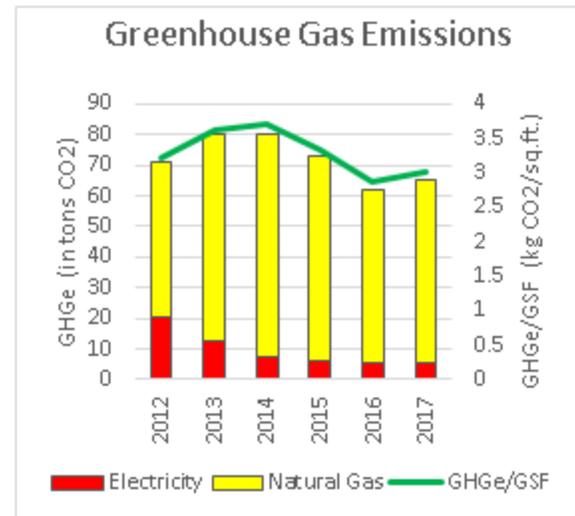
*unofficial data

WHAT WE'RE DOING NOW

- New HVAC and building controls are being installed to greatly improve the operating efficiency of the building.

OUR PLANS FOR THE FUTURE

- In 2018, the building will be undergoing rehabilitation, including envelope repairs, new insulation and cladding.





Fire Station No. 2

2665 Reid Side road
Milton, Ontario

Built in 2003, Fire Station No.2 is a year-round part-time facility shared with both Halton Emergency Management Services (EMS) and Halton Police with no full-time occupants. Three-hour training sessions are scheduled approximately once per week with approximately 20 occupants per training session. Facilities include a three-truck apparatus bay, training rooms, kitchen, lounge and office space. Due to location, heating fuel comprises of on-site propane tank.

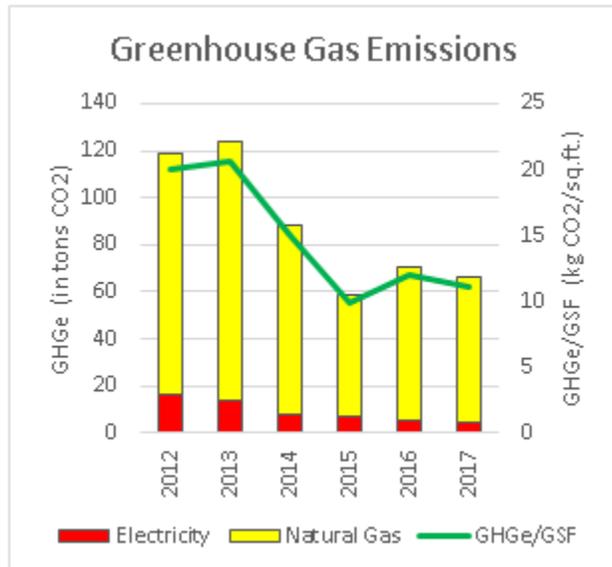


	2012	2013	2014	2015	2016*	2017*	2018	2019	2020
GSF	5,912	5,912	5,912	5,912	5,912	5,912			
Electricity (kWh)	155,303	162,110	152,533	154,752	143,516	121,047			
Natural Gas (m³)	54,503	57,790	42,692	27,371	34,157	32,180			
GHGe (tons CO₂)	117.96	121.58	88.71	58.02	70.62	65.96			

*unofficial data

WHAT WE'RE DOING NOW

- Ongoing improvements to control systems and related mechanical equipment to maintain operating efficiency.





Fire Station No. 4

405 James Snow Parkway
Milton, Ontario

Built in 2010, Fire Station No.4 is a LEED-NC (Leadership in Energy and Environmental Design – for New Construction) Certified facility approximately 10,000 ft² in size providing support to increasing call volumes in Milton's urban core. The facility is operational year-round with a fifteen-person crew based out of the station 24 hours per day, seven days per week and part-time staff responding as required. It is comprised of apparatus bays supporting four fire trucks; support facilities; meeting and training rooms; and a historical display area. Organized tours of the facility occur on an as-requested basis however the facility is not generally open to the public.

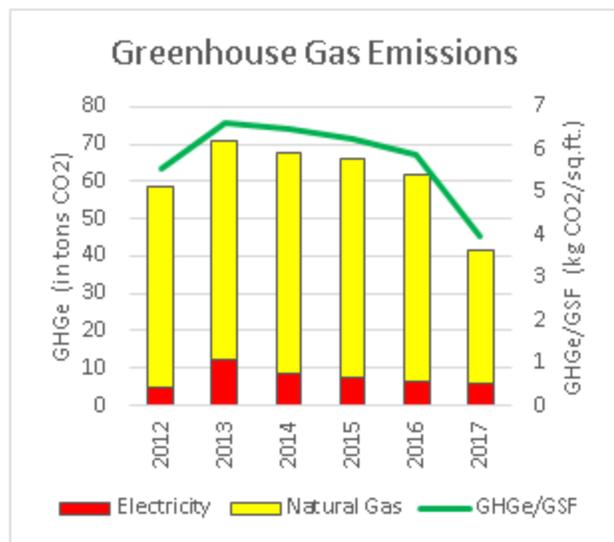


	2012	2013	2014	2015	2016*	2017*	2018	2019	2020
GSF	10,500	10,500	10,500	10,500	10,500	10,500			
Electricity (kWh)	44,291	143,216	168,342	173,131	157,607	142,227			
Natural Gas (m³)	28,675	30,984	31,323	31,027	29,182	18,949			
GHGe (tons CO₂)	58.47	69.47	67.91	65.68	61.73	41.68			

*unofficial data

WHAT WE'RE DOING NOW

- Ongoing improvements to control systems and related mechanical equipment to maintain operating efficiency.





Civic Operations Centre

5600 Regional Road 25
Milton, Ontario

The Operations Yard is a year-round operations facility designed to LEED Certified Standards consisting of two main sections; office space, and truck bays that house a portion of the fleet of maintenance. Heating and cooling is provided to the office wing, while the truck bay is a heating only structure. The Civic Operations Centre, consisting of the following:



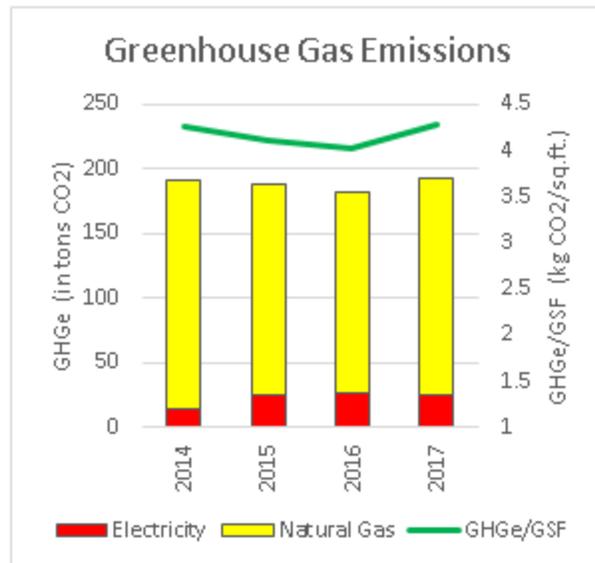
- Operations & Administration Building (45,000 sqft)
- Truck Shelter (7,100 sqft)
- Unheated Storage (4000 sqft)
- Wash Bay Facility (3,700 sqft)
- Fueling Station with 2 kiosks (2,500 sqft)

	2012	2013	2014	2015	2016*	2017*	2018	2019	2020
GSF	0	0	45,000	45,000	45,000	45,000			
Electricity (kWh)	0	0	276,164	584,362	659,463	621,583			
Natural Gas (m³)	0	0	93,746	85,560	81,659	88,643			
GHGe (tons CO₂)	0.00	0.00	191.87	185.46	181.48	193.23			

*unofficial data

WHAT WE'RE DOING NOW

- Geo-thermal heating system provides low-impact heating.
- Building automation system improves energy efficiency.
- Highly reflective roof membrane to reduce the heat island effect.



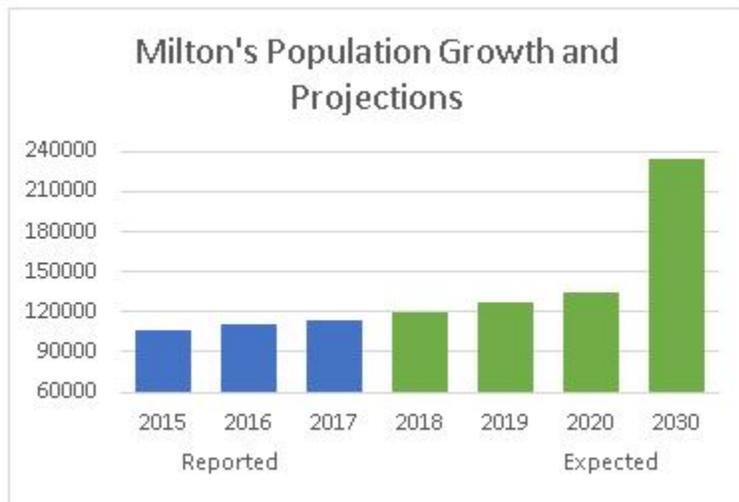


Section IV Action Plan

Targets and Goals

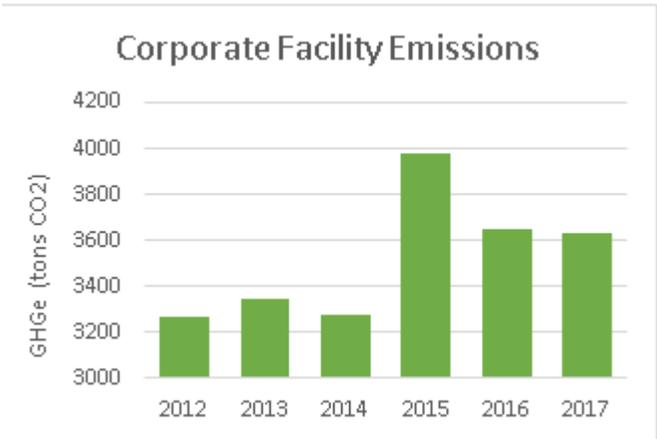
While the ultimate goal of the Town of Milton is to create a clean, sustainable and prosperous future of all of our community, we recognize the importance of setting targets and goals that are realizable within the scope of this action plan. Though there are unique challenges to both the Corporation and Community Energy Plans, the Corporation of Milton must also demonstrate its commitment to responsible energy leadership by committing to the same target goals that will be set out in the Community Plan.

In the large view, Milton is committed to moving towards the emissions reduction targets established in the Ontario Climate Change Action Plan (OCCAP). These targets provide a measuring stick against which to weigh our performance, as well as a larger context to understanding our emissions reduction efforts. However, there are a number of challenges that make the targets established in the OCCAP unsuitable for the goals of this plan. Milton's population is expanding at a rate much higher than the provincial average. Older infrastructure, facilities, and community spaces, designed to fit the needs of the time, are being used more intensively, while the demand for new development is high. We are also attempting to catch up with many of our larger neighbours in developing and implementing a community-wide understanding of our energy uses and emissions. The Milton Green Innovation Plan is our first foray into creating comprehensive Corporation and Community Energy Plans, and we recognize that it will take time to develop the baseline information and understanding between stakeholders that will be necessary to achieve our OCCAP goals. Setting a goal for this first iteration of the action plan must both address the challenges Milton faces, and provide a clear path forward to plan towards.

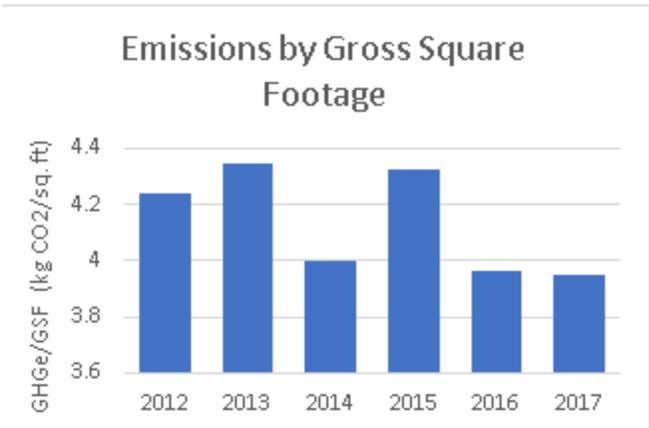




In the context of the Corporate Plan, we are able to construct energy and emissions baselines from the corporate facilities. However, looking at the emissions aggregate does not present a very informed picture. New facilities went into operation, such as the Civic Operations Centre and Fire Station Headquarters in 2014 and the Mattamy National Cycling Centre in 2015, while older buildings such as the Boyne Community Hall were no longer in use. The sharp increase seen in 2015 was the result of these new facilities beginning full-scale operations and a one-year surge in natural gas demand at the Milton Sports Centre.



Emissions can also be viewed as a function of the total gross square footage (GSF) of all of the facilities. This has the benefit of normalizing the data against facility turnover. However, it is also limited in representing the difference in energy demand across different types of spaces, and in differentiating more intensive use from less efficient structures. Between 2012 and 2017, there was a 7% reduction in emissions by GSF. However, energy intensive Sherwood Community Centre set to open in 2019 is expected to significantly increase this metric.



Population can also be used to normalize the emissions data. This has the benefit of tracking the emissions in proportion to the growing size of the community, and can in part account for the more intensive use of the facilities as demand grows. However, it is also not very representative of the performance of the facilities themselves.



Setting goals for this 5-year action plan should reflect the challenges we are currently facing and what can be realistically realized within the plan's scope, while at the same time advancing the vision of the Milton Green Innovation Plan. Our goals with this plan are;

- Continue gathering energy use and emissions data to build a more robust baseline against which performance can be measured.
- Update Milton's existing facilities and legacy buildings through an energy audit and equipment replacement strategy to continually improve performance.
- Utilize innovative design and energy management in all new facilities to meet or exceed the highest standards in sustainable development.
- Foster energy conscious employee behaviour to create a culture of conservation.
- Seek out new opportunities for Deep Green projects, innovative developments and sustainable solutions across Milton.

Legacy Buildings

Existing facilities present both a challenge and a number of opportunities to energy use management and emissions reductions. In comparison to modern facilities, legacy buildings are generally much less energy efficient, and were often not designed with such concerns in mind. However, this can often present significant opportunities to improve upon existing performance, as many relatively simple solutions can produce immediate results. While recommissioning an older building has the potential to produce the most significant change, it is often not an economical or practical choice. However, where improvements can be made, the opportunity must be taken.

Many of Milton's older facilities have already made progress in taking advantage of the most readily available avenues of energy use management. LED lighting has been installed in many of the older builds, while reflective roof membranes and building automation systems are being used to control energy demand. However, many similar opportunities still remain, and are an important part in reducing the overall emissions generated by these facilities.

An Equipment Replacement and Energy Audit Strategy has also been developed to take advantage of opportunities for further improvement. This strategy looks at the budgetary equipment replacement cycle already in place and matches it with incentives and opportunities available to more energy efficient choices. This strategy has been prepared to meet the 2018 Equipment Replacement List, and should be updated in a timely manner.



New Facilities

Milton has a strong record in recent years in developing new buildings at a very high standard of environmental performance. Recent constructions such as the Mattamy National Cycling Centre are built to LEED certified standing and have incorporated numerous energy demand management and reduction strategies into their design.

Maintaining this strong commitment to energy conscious design will be an integral part to working towards the OCCAP goals. As Milton grows and new facilities are constructed, they will be contributing a net increase to our emissions totals, and therefore minimizing that increase while seeking reductions elsewhere will be necessary.

Employee Behaviour

A significant avenue to emissions reduction on an individual level can be achieved through the behavioural training and education of Town employees. Workshops such as the Employee Engagement & Energy Awareness Program (EEEAP) are designed to educate employees in incorporating simple changes that can achieve significant energy savings through operational energy efficiencies. Training with automation systems also allows for active adjustments to be made to changing conditions, taking advantage of all possible efficiencies. These efforts, taken on an individual level, can have a large cumulative impact and ensure that energy management best practices are achieved.

The Town has also committed to larger-scale events such as Earth Hour, powering down wherever possible. These events are important for fostering the wider culture of conservation among our employees and across our community. Education and awareness are crucial to an effective energy management plan, and will play an evolving role in the Milton Green Innovation Plan.

Driving Towards Innovation

In addition to our emissions reduction efforts and commitment to responsible growth, the Town must be proactive in seeking out new and innovation solutions to sustainable development across our community.



Section V Implementation

Oversight

The Milton Green Innovation Plan and the development of the Corporate and Community Energy Plans have been overseen by a Steering Committee comprised of representatives from the Town, energy utilities, and experts in the field. Oversight of the Plans once they have been developed will remain with the Town's Facilities Department and any additional partners as they are required.

Renewal Cycle and Reporting

GEA reporting requires an updated energy conservation plan be completed and publicly posted every five years, while energy use and GHG emissions data be submitted and made available every year. This plan should be updated quarterly to reflect the most recent energy use data and to update the facility sheets as recommended actions are undertaken and new initiatives are planned.

As part of Milton's GEA compliance strategy, this plan will need to be reviewed and updated after five years.

Monitoring and Measurement

As the five-year Corporation Energy Plan is implemented, accurate accounting of energy demand and consumption will be required to sustainably satisfy the annual GEA reporting regimen. In addition to satisfying reporting requirements, monitoring and measuring consumption will allow the town to communicate successes to staff and residents.

Monthly utility billing data has been used to record facility-wide electricity and natural gas consumption and the derived the GHG emissions, and will continue to be the primary data gathering method. Site-specific sub-metering and internal control data will be collected where available, and will be expanded upon as it becomes available at additional facilities.

Resource Implications

Once the final plan is approved, resource implications will be calculated in concert with the Town.

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