



# **Greater Peterborough Area Climate Change Action Plan**

**Municipality of Trent Lakes  
Partners for Climate Protection Milestone 4 & 5 Report  
Corporate Sector Implementation, Monitoring and Reporting Results**

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## Section 1: Introduction

The effects of climate change are projected to intensify over the next decade. The Greater Peterborough Area's annual average temperature is projected to rise 2.1°C to 4.2°C above current levels (Appendix A). A changing climate will exasperate extreme weather events as the following risks will become more prevalent:

- Heightened frequency of severe rainfalls and windstorms
- Mean winter temperatures in 2030 to rise from -7°C to -4.9°C
- A 20% rise in 10-year storm rain events projected by 2030
- Days above 30°C to increase to 23 days from 6 days by 2030
- Chance of freezing rain events 40% more probable in winter

In 2018, the United Nation's Intergovernmental Panel on Climate Change (IPCC) released a special report urging mitigation of greenhouse gas (GHG) emissions to limit the global average temperature increase to only 1.5°C from the current 1°C of global warming. The IPCC recommends that a decrease in GHG emissions of 45 percent from 1990 levels by 2030 is necessary to prevent the worst implications of climate change. At present national commitment levels, a 3°C rise in global heating is forecasted by the year 2100.

The good news is that climate change can still be managed that restrains the worst effects, but immediate action is critical. Municipalities have within their authority the ability to influence positive climate stewardship among its operations and the communities they serve. By leading by example, municipalities can demonstrate this affirmative approach to climate actions by curtailing GHG emissions from all corporate facilities and assets. Ratcheting down all GHG emissions originating from corporate assets will reduce the Municipality of Trent Lake's overall contribution as a source of climate change.

## Section 2: Overview

### Background

In 2012, the City and County of Peterborough, the eight-member Townships, Curve Lake First Nation, and Hiawatha First Nation adopted the Greater Peterborough Area Integrated Community Sustainability Plan, coined Sustainability Peterborough Plan. Within this Plan, climate change was identified as one of the eleven key theme areas.

In 2014, each of the twelve Greater Peterborough Area (GPA) member communities came together to develop a Climate Change Action Plan (CCAP), designed to reduce local contributions to climate change while preparing the community for future changes. They joined a network of more than 250 other communities across Canada to address climate change through participation in the Federation of Canadian Municipalities' Partners for Climate Protection (PCP) program. The PCP program aims at reducing GHG emissions from both municipal/First Nation operations ("corporate" emissions) and the community at large ("community" emissions). The program uses a five-milestone (Table 1) framework:

**Table 1. Partners for Climate Protection Milestone Framework**

	Milestone Description	Status
Milestone 1	Create a greenhouse gas emissions inventory & forecast	completed 2015
Milestone 2	Setting an emissions reductions target	completed 2016
Milestone 3	Developing a local action plan/CCAP	completed 2016
Milestone 4	Implementing the local action plan	underway 2019
Milestone 5	Monitoring progress & reporting results	underway 2019

**Milestone 1 - GHG Emissions Inventory and Forecast**

The CCAP established a 2011 GHG emission baseline (Table 2). As outlined in the Milestone 1 report (<https://sustainablepeterborough.ca/wp-content/uploads/2015/11/CCAP-Township-of-Trent-Lakes-PCP-Milestone-1-Report-DRAFT.pdf>), the total Corporate Sector emissions for the Municipality of Trent Lakes was 824 tonnes of carbon dioxide equivalent (tCO<sub>2</sub> e).

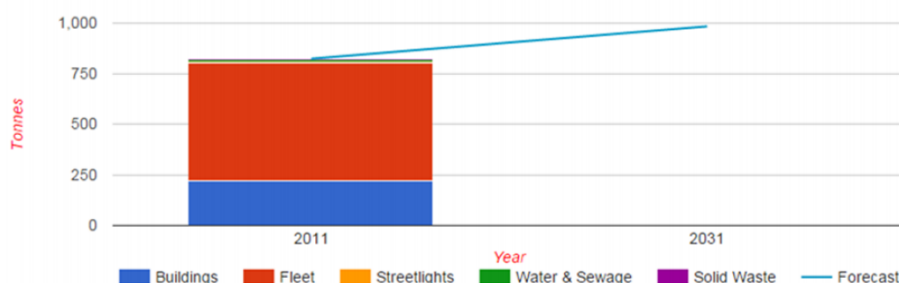
**Table 2. Trent Lakes Milestone 1 GHG Emission Sources**

Sector	Emissions (tCO <sub>2</sub> e)	Source	Emissions (tCO <sub>2</sub> e)
Buildings	221	Natural Gas	0
Fleet	586	Electricity	56
Water & Sewage	10	Gasoline	144
Streetlighting	4	Diesel	443
Solid Waste	3	Propane	103
<b>Total</b>	<b>824</b>	Fuel Oil	76
		Solid Waste	3
		<b>Total</b>	<b>825</b>

(Note: totals are not equal due to rounding)

A business-as-usual (BAU) forecast is an estimate of annual GHG emissions projected into the future with population growth if the Municipality continues to operate exactly as it did in 2011 (i.e. if nothing is done to reduce emissions). The BAU forecast for corporate operations is based on annual growth rates derived from official population projections. It was assumed that municipal operations would increase with population growth – this aligns with standard PCP methodology for creating BAUs. Emissions from corporate operations are projected to increase to 984 tCO<sub>2</sub> e per year by 2031, compared to 825 tCO<sub>2</sub> e per year in 2011. This BAU projection is presented below in Figure 1.

**Figure 1. Trent Lakes Baseline Emissions**



## **Milestone 2 – Setting an Emissions Reduction Target**

In 2016, Trent Lakes completed Milestone 2 that established a GHG emissions reduction target. A corporate sector GHG emissions reduction target of 26 percent was established using 2011 as the baseline year. This reduction target is equivalent to removing 216 tCO<sub>2</sub> e from municipal operations by 2031, compared to their 2011 baseline level of 825 tCO<sub>2</sub> e emitted per year.

## **Milestone 3 – Developing a Local Action Plan/CCAP**

One of the key requirements of the completion of Milestone 3 was the adoption of both the Corporate Sector and Community Sector emissions reductions targets and the Action Plan by the respective Council. On October 16, 2016, the Council of the Municipality of Trent Lakes passed Motion R2016-602:

“That Council receive the presentation by Lura Consulting for their information, and further

That the draft Greater Peterborough Area Climate Change Action Plan be adopted; and further

That the Municipality of Trent Lakes' Community Sector and Corporate (Municipal) Sector emission reduction targets of 39 percent and 26 percent respectively, and associated action plan be adopted.”

The CCAP outlined nine overarching strategies to remove 216 tCO<sub>2</sub> e from municipal operations by 2031. Planning, tracking, and evaluating the actions and projects that reduce GHG emissions are required to understand and monitor progress against its GHG emission commitment target. Evaluating corporate mitigation successes ultimately enables policymakers to decide what initiatives or new strategies could be enacted to limit further emissions.

The CCAP was developed to outline the potential actions to assist the Municipality in achieving its emissions reduction targets. Further details on specific strategies are provided in the Milestone 2 and 3 Report <https://sustainablepeterborough.ca/wp-content/uploads/2016/11/Chapter-10-Trent-Lakes-Community-and-Corporate-Climate-Action-Plans-FINAL.pdf>

## **Section 3: Milestone 4 – Implementation of the CCAP**

The implementation of climate change mitigation and adaptation strategies is a continual process in the effort to reduce GHG emissions from corporate assets. Since 2011, Trent Lakes has striven to incorporate many of the nine strategies outlined in the CCAP. In 2019, the township submitted its *Energy Conservation and Demand Management Plan 2019 Update* document to the Ontario government compliant with O. Reg. 507/18 (previously known as 397/11) which delineated completed actions as well as recommitting the township to energy conservation and GHG reduction (Appendix A). The following (Table 3) presents completed corporate actions that the municipality has achieved to date.



Lastly, only actions with discernable GHG reductions are quantified in this table while the remaining actions have GHG impacts that are either nominal or non-extractable to be tallied.

**Table 3. Completed and Ongoing Corporate Mitigation and Adaptation Actions**

CCAP Corporate Strategy	Action Description	Year	Quantifiable GHG saved (tCO <sub>2</sub> e)
Strategy 4: Implement an exterior LED lighting retrofit program	Galway Hall replaced exterior building lighting with LED fixtures	2011	
Strategy 4: Upgrade building envelope insulation	Installed new vinyl siding, steel roof and reinsulated Galway Hall to increase energy efficiency	2011	
Strategy 2: Preventative maintenance	Renovated washroom at Galway Hall with new plumbing to prevent leaks and conserve water	2011	
Strategy 4: Upgrade building envelope insulation	Completed major renovation of Lakehurst Hall which included new foundation work, exterior walls, insulation, siding, roof and doors	2011	
Strategy 4: High-efficiency appliances installed	New Energy STAR kitchen appliances installed at Lakehurst Hall	2011	
Strategy 4: Upgrade building envelope insulation	Installed new strapping, vinyl siding and reinsulated Galway Firehall 3 to increase energy efficiency	2011	
Strategy 4: Upgrade building envelope insulation	Installed new strapping, vinyl siding, roof and reinsulated Cavendish Firehall 2 to increase energy efficiency	2012	
Strategy 9: Waste diversion initiatives	Eliminated 'Free Tip Day' to reduce waste sent to landfill by eliminating free all-day bag drop-offs	2012	
Strategy 9: Waste diversion initiatives	Implemented annual 52-bag limit and introduced a charge for all additional bags to restrict waste sent to dump	2012	
Strategy 9: Waste diversion initiatives	Increased tipping fees to reduce the amount of waste sent to landfill	2012	
Strategy 1: Institutionalize energy efficiency and low carbon thinking	Established an energy initiative reserve fund. All unspent budget funds for electricity and fuel are transferred to this reserve to be used for future energy conservation initiatives	2013	
Strategy 2: Preventative maintenance	Installed new low-flow toilets at Municipal Office to conserve water	2013	

Strategy 2: Enhanced facility operational efficiencies	Curtains added to Buckhorn Sports Pad to extend ice surface life and decreased energy usage linked to resurfacing	2013	
Strategy 4: High-efficiency appliances installed	Installed new high-efficiency propane furnace at Cavendish Firehall 2 with new plenum adaptations and ductwork	2013	
Strategy 9: Waste diversion initiatives	Created new 'clean wood' stream that diverted wood products away from the landfill which was then used for biomass wood chips	2013	
Strategy 2: Preventative maintenance	Replaced leaking pressure tanks at Cavendish Hall and Lakehurst Hall with new tanks and new brass fittings to conserve water	2014	
Strategy 2: Preventative maintenance	Replaced leaking faucet at Buckhorn Library to conserve water. Installed new digitally metered water softener to replace old, failing model.	2014	
Strategy 4: High-efficiency appliances installed	Installed new high-efficiency propane furnace at Buckhorn Library	2014	
Strategy 2: Enhance building automation	Installed a digital thermostat at Buckhorn Firehall 1	2014	
Strategy 4: Upgrade fans and blowing equipment	Replaced the grill on Buckhorn Firehall 1 warm air plenum to better distribute airflow	2014	
Strategy 4: High-efficiency appliances installed	New high-efficiency propane furnace installed at Galway Firehall 3	2014	
Strategy 4: Upgrade building envelope insulation	Replaced metal siding on north and east walls of 49 Depot to eliminate drafts	2014	
Strategy 4: Remove rarely used appliance	Removed all plumbing and water heater from old dog kennel at Buckhorn Depot as no longer in use	2014	
Strategy 4: High-efficiency appliances installed	New high-efficiency propane furnace installed at Galway Depot	2014	
Strategy 7: Enhance operational efficiency of water services system	Replaced leaking service connections on Alpine Village water distribution system to conserve water and subsequent energy usage associated with the purification process	2014	

Strategy 8: Retrofitted streetlighting to LEDs	Converted 46 streetlights to LED fixtures	2015	3.75 tCO <sub>2</sub> e
Strategy 4: Upgrade building envelope	Replaced weather stripping on all exterior doors at all four firehalls: Buckhorn Firehall 1, Cavendish Firehall 2, Galway Firehall 3 and Oak Shores Firehall 4	2015	
Strategy 4: High-efficiency appliances installed	Replaced heater at Bobcaygeon Waste Transfer Station with an energy-efficient electric heater	2015	
Strategy 4: Implement an exterior LED Lighting retrofit program	Replaced lights at Crystal Lake and Cavendish Waste Transfer Stations with LED fixtures and bulbs	2015	
Strategy 6: Upgrade drinking water supply system pumps	Replaced pumps and filter media in Alpine Village and Buckhorn Lake Estates water distribution systems with high-efficiency models	2015-2016	
Strategy 9: Waste diversion initiatives	Began partnering with community groups for alcohol containers collection at all four waste transfer stations to divert these materials from the Blue Box recycling system	2015	
Strategy 9: Waste diversion initiatives	Began partnering with Diabetes Canada for placement of textile donation bins at all four waste transfer stations to divert these materials from the waste stream	2015	
Strategy 2: Enhance operational efficiency	Implemented a regular schedule for facility furnace and air conditioner maintenance to ensure maximum efficiency	2016	
Strategy 4: Implement LED Lighting retrofit program	Replaced exterior lighting with LED fixtures and installed new LED lighting at the entrance of Municipal Office. Converted pot lights in Council Chambers to LED	2016	
Strategy 4: High-efficiency appliances installed	Replaced air conditioning unit at the Municipal Office with a more efficient model	2016	
Strategy 2: Enhance building automation	Installed new programmable thermostats at Municipal Office	2016	

Strategy 4: Upgrade building envelope insulation	Re-caulked Municipal Office windows to increase building energy efficiency	2016	
Strategy 3: New buildings with high environmental performance	Decommissioned Oak Shores Firehall 4 and completed construction of the new Nogies Creek Firehall 4. The new facility was constructed to LEED standards including: <ul style="list-style-type: none"> <li>• LED lighting</li> <li>• Energy STAR appliances</li> <li>• System that redirects and captures wastewater and oil discharges from vehicles</li> </ul>	2016	
Strategy 4: High-efficiency appliances installed	Replaced failing electric water heater with propane on-demand heater at Galway Hall	2016	
Strategy 4: Implement an exterior LED lighting retrofit program	Replaced old exterior lights with LED alternatives at all three depots: 49 Depot, Buckhorn Depot and Galway Depot	2016	
Strategy 4: Implement an exterior LED lighting retrofit program	Replaced remaining exterior lights with LED alternatives at all four waste transfer stations	2016	
Strategy 4: High-efficiency appliances installed	Heat exchanger installed at Buckhorn Regional Health Centre	2016	
Strategy 4: High-efficiency appliances installed	High-efficiency air conditioners and new ductwork installed at the Kinmount Medical Centre	2016	
Strategy 4: Implement an LED lighting retrofit program	Replaced old lights with LED alternatives at Kinmount Medical Centre	2016	
Strategy 9: Waste diversion initiatives	Expanded brush and yard waste collection to the Crystal Lake and Cavendish Waste Transfer Stations to divert these materials from the waste stream	2016	
Strategy 4: Upgrade building envelope insulation	Installed new steel roof and updated insulation at Municipal Office	2017	
Strategy 4: Replace windows and doors with higher efficiency models	Replaced defective windows at the Municipal Office to eliminate drafts	2017	



Strategy 4: Implement an interior LED lighting retrofit program	Replaced all fluorescents (T8 and pot lights) with LED equivalents at Municipal Office. All bulbs at Municipal Office are now LED.	2017	
Strategy 4: Implement an interior LED lighting retrofit program	Replaced fluorescents (T8 and pot lights) with LED equivalents at Buckhorn Library. All T8 bulbs are now LED.	2017	
Strategy 4: Implement an exterior LED lighting retrofit program	Replaced exterior lighting with LED fixtures at Galway Hall	2017	
Strategy 4: High-efficiency appliances installed	Replaced failing electric water heater with propane on-demand heater at Lakehurst Hall	2017	
Strategy 6: Low emission transportation	Purchased new excavator, grader, tandem, with Tier 4 engines and new pick-up with high-efficiency engine	2017	
Strategy 9: Waste diversion initiatives	Restricted the number of free bags to 12 per quarter. Additional bags are subject to a fee.	2017	
Strategy 9: Waste diversion initiatives	Implemented a clear bag program to prevent the placement of divertible and hazardous materials into the waste stream	2017	
Strategy 9: Waste diversion initiatives	Created Waste Portal for residents to help in diverting materials from the garbage stream	2017	
Strategy 9: Waste diversion initiatives	Expanded the Waste Electrical and Electronic Equipment (WEEE) program to the Crystal Lake and Cavendish Waste Transfer Stations to divert these materials from the waste stream	2017	
Strategy 2: Enhance building automation	Installed occupancy sensor light switches in washrooms, equipment room, kitchen and furnace room at the Municipal Office	2018	
Strategy 2: Enhance building automation	Installation of smart, programmable, remote-access thermostats at Municipal Office, Buckhorn Library and Kinmount Health Centre	2018	
Strategy 4: High-performance building construction	New energy-efficient windows installed at Buckhorn Library	2018	

Strategy 2: Enhance building automation	Installed occupancy sensor light switches in washrooms, halls and kitchen at Cavendish Hall	2018	
Strategy 4: Replace windows and doors with higher efficiency models	Installed new windows at Cavendish and Galway Halls	2018	
Strategy 4: High-performance building construction	Completed HVAC project at Cavendish and Galway Halls which included: <ul style="list-style-type: none"> <li>• New high-efficiency furnaces</li> <li>• New energy recovery ventilation and refrigeration systems</li> <li>• New smart, remote-access thermostats</li> </ul>	2018	
Strategy 4: Upgrade fans and blowing equipment	Installed new furnace motor at Deer Bay Hall	2018	
Strategy 2: Preventative maintenance	Installed new pressure tank and pump and removed old supply at Galway Hall and Depot	2018	
Strategy 4: Implement an exterior LED lighting retrofit program	Replaced exterior pot lights with LED bulbs at Buckhorn Regional Health Centre	2018	

## Section 4: Milestone 5 – Monitoring Progress & Reporting Results

This progress report used 2018 data provided by Trent Lakes to ascertain how the municipality is achieving its mitigation goals with respect to its CCAP.

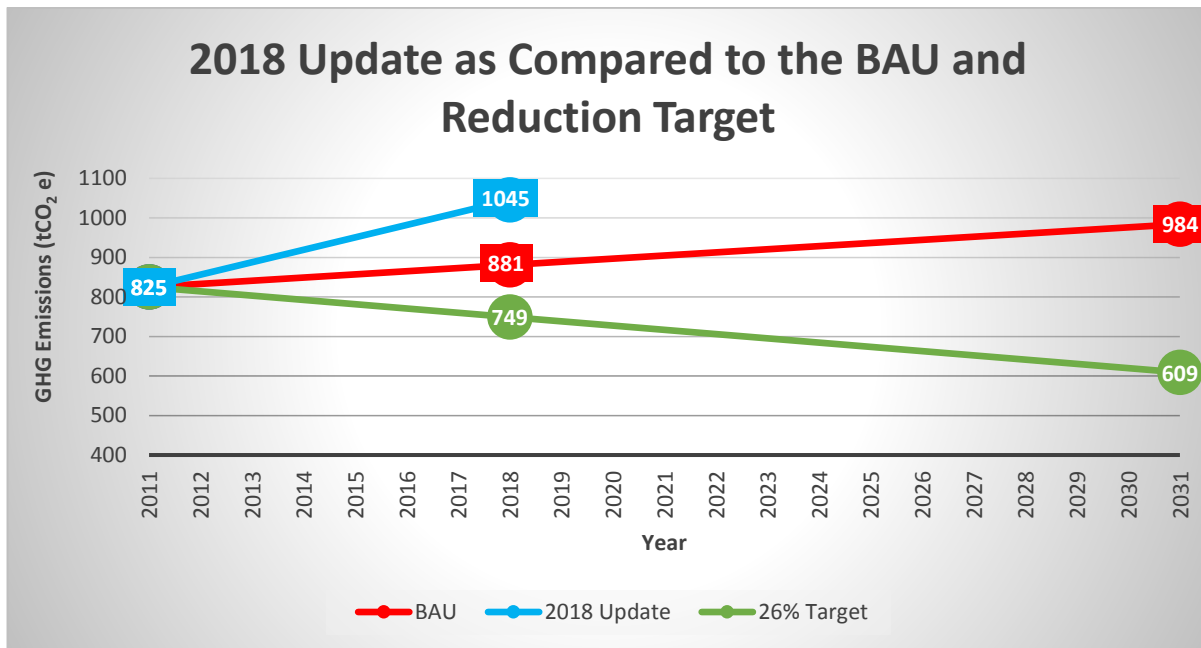
### Corporate Emission Reduction Progress in 2018

The corporate review revealed that Trent Lakes GHG emissions increased by 23 percent above the baseline (Table 5). Emissions escalated by 222 tCO<sub>2</sub>e from all the municipality's emission sources as illustrated in Figure 2.

**Table 5. Township Emission Source from 2011 to 2018**

Emission Source	2011 GHG (tCO <sub>2</sub> e)	2018 GHG (tCO <sub>2</sub> e)	Percent Difference
Buildings (Electricity, propane, and heating oil 1&2)	220	250	12%
Streetlights (Electricity)	4	0.25	-94%
Vehicles (Diesel and gasoline)	586	791	35%
Waste (Organic matter sent to landfill)	3	2	-33%
Water Treatment (Electricity)	10	2	-80%
<b>Totals</b>	<b>823</b>	<b>1,045</b>	<b>23%</b>

**Figure 2. 2018 GHG Emissions Compared with BAU and CCAP Target**



**Figure 2. The Business-as-usual (BAU) emission projections as compared to the Reduction Target goal is outlined until 2031. 1,045 tCO<sub>2</sub>e is the current emission levels attributed to Trent Lakes in 2018.**

The observed rise is due to the increase in kilometres driven by the corporate fleet which expanded in 2018 as compared to 2011. The sizable growth in diesel usage is directly a result of a public works depot being closed for vehicle storage which resulted in staff driving 40 minutes longer to a centralized maintenance yard. This extra travel time was exacerbated during the winter months when snow plowing operations had to commence at the central yard and travel the distance prior to beginning snow removal.

The increase of GHGs linked to corporate buildings is a result of the fuel switching from heating oil to propane for space heating. The expansion of propane heating did reduce the GHGs found in heating oil but outpaced the amount the GHGs that would have been found if electric sources of heating were used in Trent Lakes corporate building sector.

When analyzing the GHG reductions connected to streetlights and water treatment found that electricity associated GHG decreased sizably. This decline in electricity emissions is directly connected to the closure of all of Ontario’s coal powerplants starting in 2013 that decarbonized the electrical grid. This resulted in a fivefold decrease in GHGs linked to Ontario electricity production since 2011, as illustrated in Table 6.

**Table 6. Electricity GHG Emissions**

Year	Emission Factor (kgCO <sub>2</sub> e)
2011	0.098040
2014	0.040011
2016	0.035548
2017	0.017298

The shuttering of coal powerplants has made the entire electrical grid throughout the province a much greener option today than the one found in the baseline year. However, it should be noted that the Ontario grid still maintains natural gas-fired powerplants in its energy mix that are significant contributors to GHG emissions (IESO, 2019). More natural gas powerplants are scheduled to come online over the coming years to offset refurbishments of Ontario’s nuclear powerplants. This will result in the emission factors outlined in Table 6 to rebound and thereby negatively affect the gains found in electricity’s decarbonization. Ultimately, corporate electricity emissions will increase in the following years until the restoration of Ontario’s nuclear capacity is reinstated.

### Corporate Consumption Analysis and Discussion

Assessing energy and fuel consumption rates for all emission sources in Trent Lakes can reveal connections outlined within the corporate mitigation strategies found in the CCAP. Table 7 outlines the individual contribution from each energy source to its associated sector.

**Table 7. Trent Lakes Consumption Data per Sector**

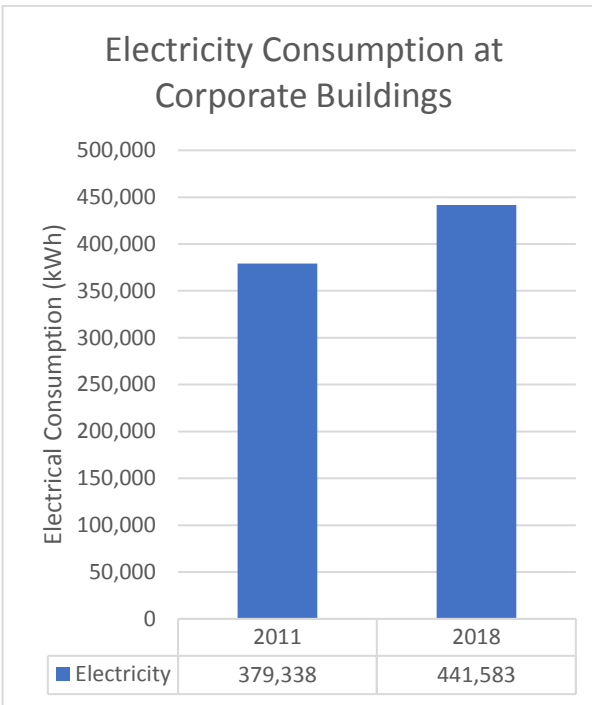
<b>2011 Consumption</b>	<b>Electricity (kWh)</b>	<b>Propane (L)</b>	<b>Heating Oil 1&amp;2 (L)</b>	<b>Gasoline (L)</b>	<b>Diesel (L)</b>
Buildings	379,338	66,543	27,867		
Water	94,447				
Streetlights	38,431				
Vehicles				62,451	163,255
<b>Totals</b>	<b>512,216</b>	<b>66,543</b>	<b>27,867</b>	<b>62,451</b>	<b>163,255</b>
<b>2018 Consumption</b>	<b>Electricity (kWh)</b>	<b>Propane (L)</b>	<b>Heating Oil 1&amp;2 (L)</b>	<b>Gasoline (L)</b>	<b>Diesel (L)</b>
Buildings	441,583	146,100	6,054		
Water	106,117				
Streetlights	4,808				
Vehicles				60,843	238,252
<b>Totals</b>	<b>552,508</b>	<b>146,100</b>	<b>6,054</b>	<b>60,843</b>	<b>238,252</b>

### Sector Strategies: All Corporate Facilities

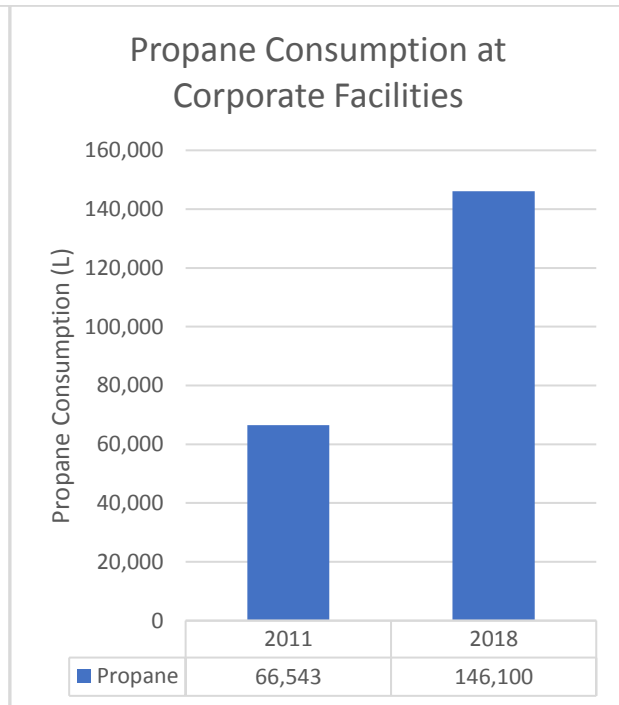
Analyzing electricity consumption (Figure 3) from all corporate facilities between 2011 and 2018 was found to have a 16 percent increase in electricity usage. This growth in consumption can be attributed to the expansion in the total square footage of the municipality’s building stock. The Nogies Creek Firehall opened in 2016 in addition to the municipality paying utility bills for Deer Bay Hall starting in 2017, thereby increasing the total corporate building footage by 1,100 m<sup>2</sup>.

Propane (Figure 4) was found to have a 120 percent increase overall. As already stated, this rise is due to fuel switching away from heating oil for space heating.

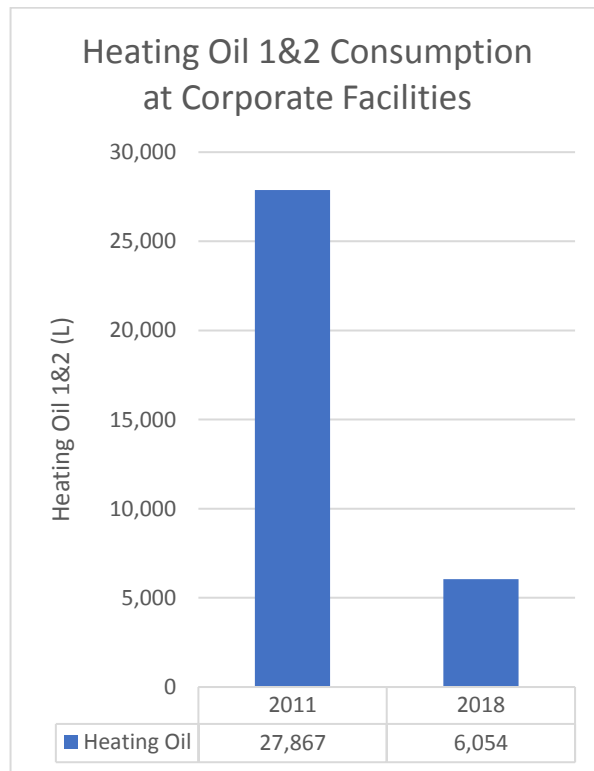
**Figure 3. Electricity Consumption**



**Figure 4. Propane Consumption**

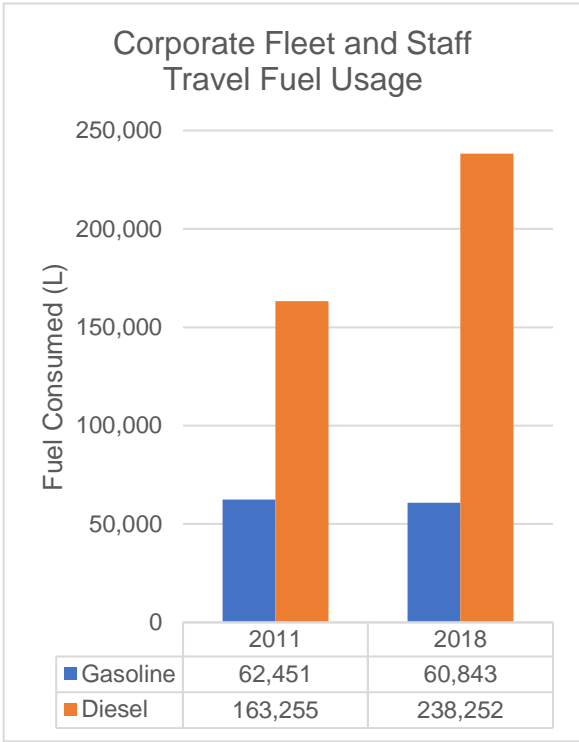


**Figure 5. Heating Oil Consumption**



A 78 percent decrease in heating fuel usage directly resulted from propane supplanting the fuel for space heating (Figure 5).

**Figure 6. Fleet + Staff Travel Fuel Consumption**

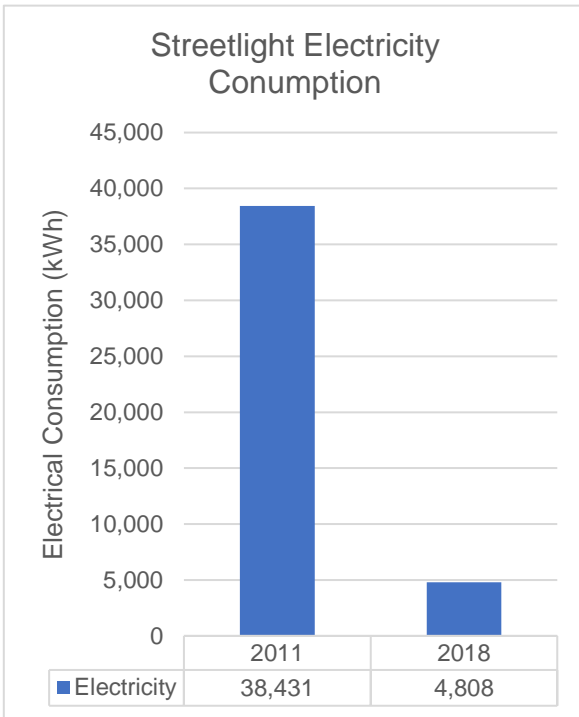


**Sector Strategies: Corporate Fleet and Staff Travel**

The corporate fleet and staff travel (Figure 6) were found to have a 46 percent increase in diesel usage as opposed to a 3 percent decrease in gasoline consumption. Due to longer fleet travel times because of a closed maintenance vehicle depot increased diesel usage.

The drop-in gasoline consumption could be attributed to fewer departmental staff travel over this review period.

**Figure 7. Electricity Consumption**



**Sector Strategies: Streetlights**

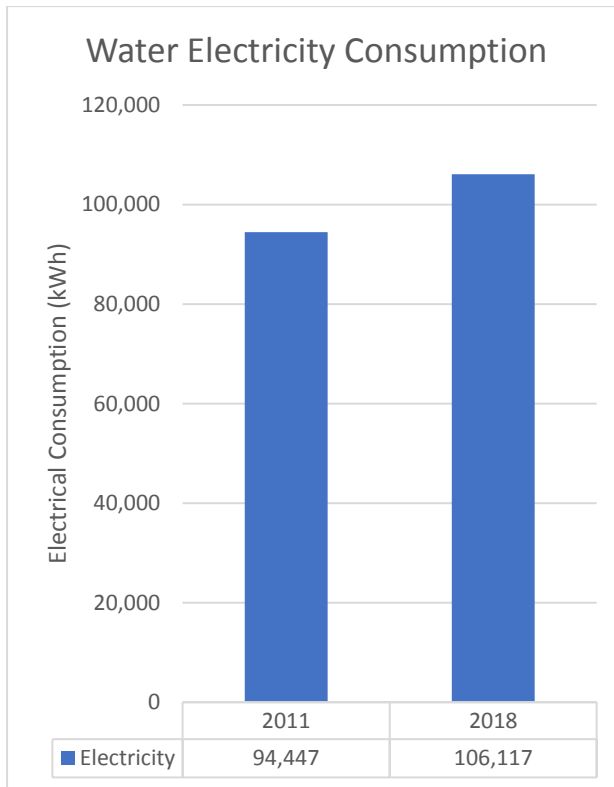
Streetlights had a noticeable decrease in electricity usage by 87 percent since 2011 (Figure 7). The planned energy lighting retrofit program in 2015 saw 46 streetlights converted to LED fixtures.



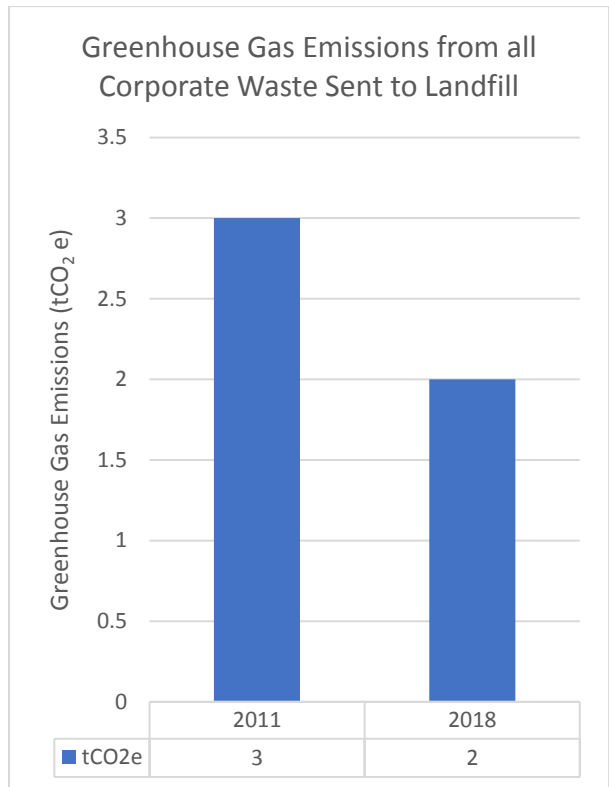
## Sector Strategies: Water

The water infrastructure in Trent Lakes saw a rise in electricity of 12 percent (Figure 8). This sector is not directly controlled or staffed by the municipality but is contracted out which may be the reason that usage has risen.

**Figure 8. Water Energy Usage**



**Figure 9. Waste GHG Emissions**



## Sector Strategies: Corporate Waste

All corporate waste that is composed of organic material (i.e. food, leaf & yard, paper/cardboard, etc.) sent to landfill decreased by 1 tCO<sub>2</sub> e of GHG emissions (Figure 9). This decrease in emissions is due to new waste audits conducted by County Waste Management officials that recalibrated the assumptions of what entered the waste stream (Table 8). Those assumptions were applied to corporate waste as they were the best models available to ascertain greenhouse gas emissions from waste.

**Table 8. Waste Composition**

Waste Composition (%)		
Type	2011	2018
Food scraps	16	35
Garden/plant	3	2
Paper/cardboard	10	11
Wood products	3	5
Textiles	5	6

## Future Corporate Actions

The following is a renewed timeline for Milestone 3 corporate actions as of this report (Table 9). The timeframe has been adjusted to omit long-term action due to that range nearing the 2031 target.

**Table 9. Projected Timeline for Corporate Mitigation Actions**

Municipality of Trent Lakes Corporate Action Plan	Timeframe		
	Underway	Short (1-5 years)	Med (6-10 years)
<b>Buildings</b>			
<b>Strategy 1: Institutionalize energy efficiency and low carbon thinking into the organization</b>			
Implement employee training for energy efficiency		X	X
Reinforce staff culture of conservation and behaviour change to reduce electricity and heating in day-to-day activities		X	X
Establish a policy to consider the highest energy efficiency as part of procurement requirements and evaluation	X	X	X
Monitor incentive programs offered through utilities and other third-party funding sources to be leveraged for implementing energy efficiency improvements		X	X
<b>Strategy 2: Enhance Operational efficiency of existing buildings</b>			
Develop and deliver an equipment preventative maintenance program on an ongoing basis	X	X	X
Conduct regular audits of township facilities on a rotational basis to identify opportunities for improved efficiencies and produce annual report cards		X	X
Explore building automation systems to optimize building operations		X	X
Conduct building re-commissioning to optimize building operations		X	X
Implement a utility bill validation process to identify and correct any billing issues and variations in energy usage	X	X	X
<b>Strategy 3: Build municipal facilities to ensure high environmental performance</b>			
Establish a Green New Building Policy to require new municipal buildings and major renovations be built to high environmental standards			X
<b>Strategy 4: Improve the environmental performance of existing municipal facilities</b>			
Conduct energy audits/assessments of each facility to identify opportunities to improve energy efficiency			X
Continue implementation of interior and exterior LED lighting retrofit program in facilities where feasible		X	X
Replace appliances with Energy STAR-rated appliances as needed		X	X
Upgrade insulation/building envelope while conducting other essential building work		X	X

Continue to replace windows and doors with high efficiency according to replacement schedule/need		X	X
Replace mechanical equipment with high efficiency according to replacement schedule/need		X	X
Upgrade fans and blowing equipment in remaining facilities		X	X
<b>Strategy 5: Utilize renewable energy sources</b>			
Continue to seek and implement opportunities for solar voltaic panels and other renewable energy options at all municipal facilities		X	X
Explore converting electric hot water to solar			X
Work with Peterborough Utilities Inc. to explore the feasibility of hydro energy generation			X
<b>Fleet</b>			
<b>Strategy 6: Transition the municipal fleet to be more efficient and less carbon-emitting</b>			
Develop and implement a Green Fleet Strategy and replacement schedule that considers the following: a) right-sizing vehicle/ appropriate vehicle class through replacement schedule b) transitioning to low emission and alternative fuel vehicles c) use of anti-idling technology d) fuel and vehicle performance monitoring		X	X
Implement an operator training and education program		X	X
Formalize and continue with a preventative maintenance program for vehicles and equipment		X	X
Explore conducting vehicle/fuel performance audits	X		
<b>Water &amp; Sewage</b>			
<b>Strategy 7: Enhance the operational efficiency of the water services system</b>			
Upgrade drinking water supply system pumps	X		
Upgrade remaining mechanical equipment as per replacement schedule		X	
Review and optimize pumps and blowers		X	
Continue to deliver preventative maintenance program		X	X
Continue to deliver operator training and education program		X	X
Continue to monitor and track the energy performance		X	X
<b>Streetlights</b>			
<b>Strategy 8: Improve the energy efficiency of streetlighting system</b>			
Retrofit of all 46 streetlights	COMPLETED		
<b>Solid Waste</b>			
<b>Strategy 9: Reduce the amount of organic waste generated through municipal operations</b>			
Continue to participate in office waste reduction and diversion initiatives		X	X

Continue to collect organic waste from Township offices and manage in backyard composters		X	X
Monitor and track corporate waste generation and diversion		X	X
Develop and implement a corporate green procurement policy			X

**Asset Management**

In 2017, the province passed Ontario Regulation 588/17, requiring municipalities to develop and adopt a Strategic Asset Management Plan (AMP) by July 1, 2019. The AMPs require climate change to be considered for all assets. The inclusion of energy-related factors in the AMP would promote energy conservation as a priority in the municipal budget and longer-term financial planning. The AMP is to be reviewed every five years. The AMP includes a vehicle replacement schedule to replace older vehicles with new, more efficient substitutions.

**Decision-making Process**

Developing and implementing climate actions is well entrenched in Trent Lakes because of the Municipal Council Motion R2016-602. This resolution has led to the operationalization by senior management and staff in carrying out actions. Staff plan and implement specific actions that are dependent on the municipal budgetary cycle, external incentives, grants, regional leadership/ best practices, and an end-of-life replacement schedule. All these factors dictate the level of corporate climate action realization within the Municipality.

**Conclusion**

With the adoption of the Climate Change Action Plan in October 2016, the Municipality of Trent Lakes committed to reducing its corporate sector GHG emissions by 26 percent below 2011 baseline levels by 2031.

Trent Lakes has completed several building retrofits with the goal of conserving energy and GHG emissions since 2012. Actions included replacing interior light fixtures with LEDs, upgrading facility building automation systems, mechanical improvements, and converting streetlighting to LED fixtures. However, considerable usage of diesel and propane offset the GHG gains inherently found in electricity.

Many opportunities remain for further energy retrofits that can reduce corporate GHG emissions. By engaging in proactive measures like upgrading vehicles to more fuel-efficient models or expanding the use of electric heat, the municipality will be able to achieve its 2031 CCAP goal.

## Works Cited

ICLEI-Canada. (2018). Future Climatic Projections: City of Peterborough. Retrieved from: [https://www.peterborough.ca/en/city-hall/resources/Documents/ICLEI-climateinfographic\\_updated\\_sep17.pdf](https://www.peterborough.ca/en/city-hall/resources/Documents/ICLEI-climateinfographic_updated_sep17.pdf)

IESO. (2019). *2018 Electricity Data*. Retrieved from: <http://www.ieso.ca/en/Corporate-IESO/Media/Year-End-Data>

IPCC. (2018). *Global Warming of 1.5°C*. Retrieved from: [https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15\\_Headline-statements.pdf](https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Headline-statements.pdf)

Sustainable Peterborough. (2015). Greater Peterborough Area: Climate Change Action Plans.

University of Waterloo. (2015). *The Changing Climate of Waterloo Region*. <https://uwaterloo.ca/climate-centre/sites/ca.climate-centre/files/uploads/files/climate-infographic.pdf>

# Appendix A

## ***Future Climate Projections***

[https://www.peterborough.ca/en/city-hall/resources/Documents/Climate-Science-Report\\_Peterborough\\_Sep17-2018.pdf](https://www.peterborough.ca/en/city-hall/resources/Documents/Climate-Science-Report_Peterborough_Sep17-2018.pdf)

## ***Energy Conservation and Demand Management Plan 2019-2023***

[http://www.trentlakes.ca/wp-content/uploads/2019/05/2019\\_Energy-Conservation-and-Demand-Management-Plan-2019-Update.pdf](http://www.trentlakes.ca/wp-content/uploads/2019/05/2019_Energy-Conservation-and-Demand-Management-Plan-2019-Update.pdf)