
COUNTY OF HALIBURTON



**CORPORATE
CLIMATE CHANGE
MITIGATION PLAN**

**CHAPTER 4:
MUNICIPALITY OF
HIGHLANDS EAST**

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MESSAGE FROM THE MAYOR

Climate change is a global problem and affects us all. We are seeing extreme temperatures, warmer winters, increased significant weather events, lower water levels and impacted ecosystems. The consequences of climate change cannot be ignored. Greenhouse gases effect climate change and we as a community need to work together to mitigate these impacts through the reduction of greenhouse gases. Haliburton County and member municipalities have committed to reducing greenhouse gases and will strive to implement strategies that will assist with mitigation. The Corporate Climate Change Mitigation Plan is the first of many mitigation measures to be implemented. Together we can.

MAYOR DAVE BURTON
MUNICIPALITY OF HIGHLANDS EAST

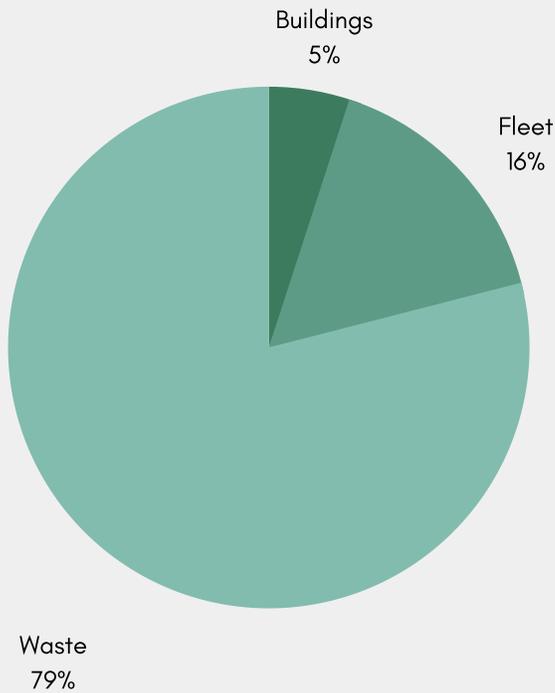
ACKNOWLEDGEMENTS

This plan was created by the Climate Change Coordinator in collaboration with the Environment, Fire, Property and Facilities and Roads departments.

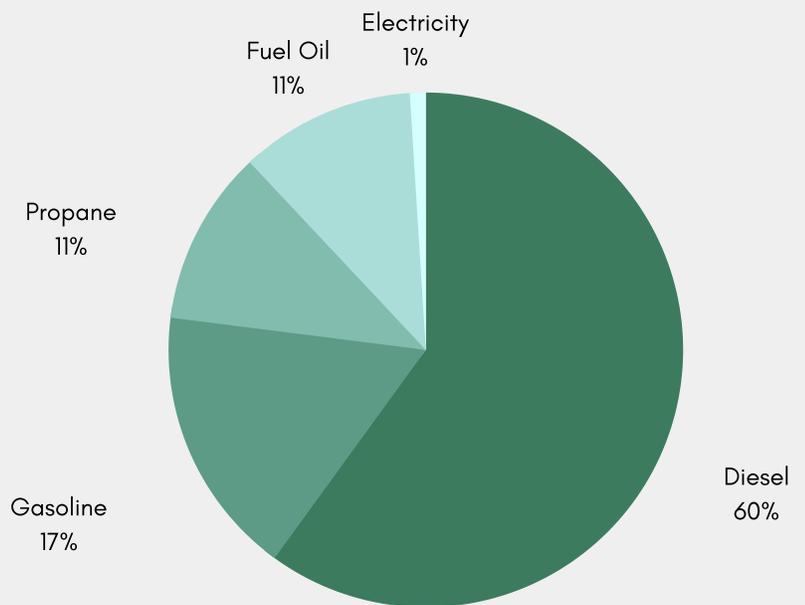
GLOSSARY OF ACRONYMS

BAU	Business as usual
CH ₄	Methane
CO ₂	Carbon dioxide
tCO ₂ e	Tonnes of carbon dioxide equivalent
FCM	Federation of Canadian Municipalities
GHG	Greenhouse gas
GJ	Gigajoule
HVAC	Heating, ventilation and air conditioning
ICLEI	Local Governments for Sustainability
PCP	Partners for Climate Protection

EMISSIONS BY SECTOR



EMISSIONS BY SOURCE

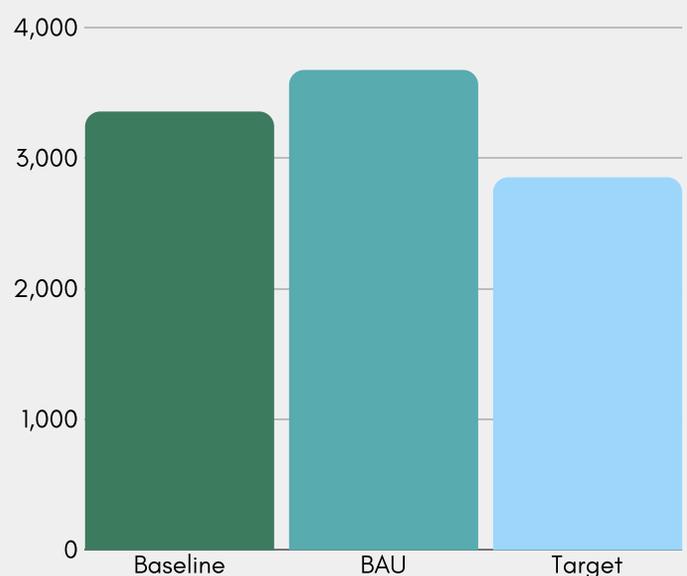


CORPORATE GHG INVENTORY

The Municipality of Highlands East emitted 3,348 tCO₂e in 2018. Corporate GHG emissions primarily come from decomposing organic waste at the landfills (79%), operating municipal fleet (16%) and heating and powering municipal buildings (5%). The Municipality consumed 13,900 GJ of energy. Emissions associated with energy consumption come from the use of diesel (60%), gasoline (17%), propane (11%), fuel oil (11%), and electricity (1%).

BUSINESS AS USUAL FORECAST

A business-as-usual (BAU) forecast provides a projection of future GHG emissions if no explicit action is taken to address climate change. Under the assumption that a growth in population is roughly equivalent to a growth in municipal operations and services, corporate emissions are forecasted to rise 10% from the 2018 baseline by 2030, from 3,348 tCO₂e to 3,666 tCO₂e.



GHG REDUCTION TARGET

The Municipality of Highlands East has set a target to reduce corporate GHG emissions by 15% below the 2018 baseline by 2030. If the target is reached, emissions will decrease from 3,348 tCO₂e to 2,845 tCO₂e.



LOCAL ACTION PLAN



Proposed actions should be read as a bank of potential opportunities for Highlands East Council to consider over the next decade. The recommended actions are best practices that have proven to be successful for reducing emissions in other municipalities but will require greater analysis on local feasibility. The majority of the actions can be a collaborative effort between the County and the four local municipalities. Municipal staff provided input through sharing their knowledge and experience and providing suggestions and critiques. Exact costs of each action will be determined during the budget planning and procurement processes. Many actions will be dependent on external funding and partnership opportunities.

LEGEND

TIMEFRAME	Short: 2020-2023 Medium: 2024-2026 Long: 2027-2030
GHG REDUCTION POTENTIAL	Indirect: Acts as a precursor for another action Low: Under 5% reduction for the sector Medium: 5-10% reduction for the sector High: Over 10% reduction for the sector
COSTS	Nominal: Little outside of staff time Low: Below \$10,000 Moderate: \$10,000-\$50,000 Medium: \$50,000-\$100,000 High: Over \$100,000

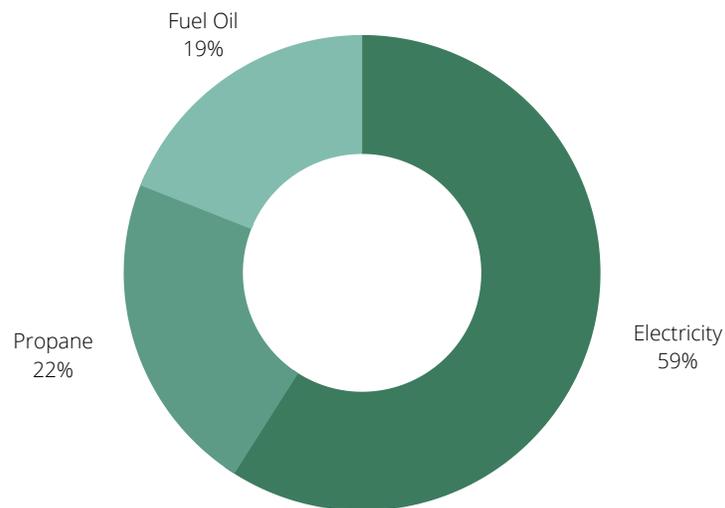
BUILDINGS

Municipal buildings include those used for administration, community centers, cultural facilities, fire stations, libraries, and vehicle storage and repairs. Municipal buildings produced 182 tCO₂e or 5% of corporate emissions in 2018. To reach a target of a 15% reduction in GHG emissions, building emissions will need to be less than 155 tCO₂e in 2030. GHG emissions from corporate buildings comes from the use of propane (47%), fuel oil (46%), and electricity (7%).

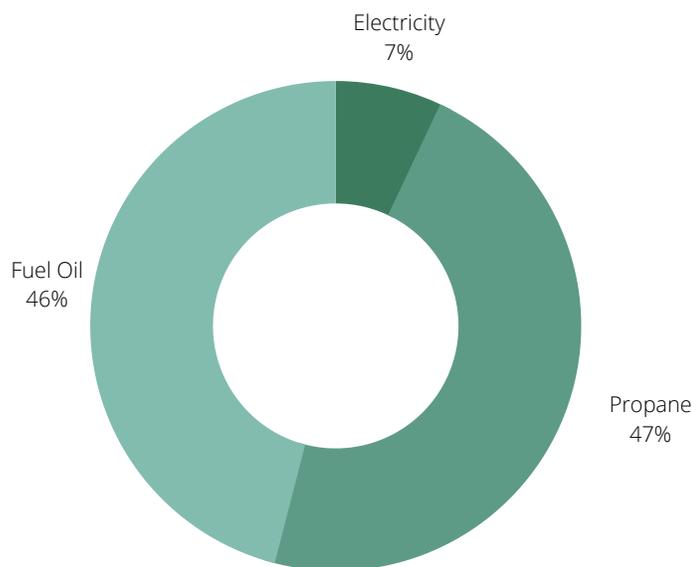
The Municipality consumed 6,300 GJ of energy in 2018 to heat and power corporate buildings and facilities. While electricity is the largest source of energy consumption, the associated GHG emissions are small due to the low carbon electricity grid in Ontario.

The Municipality built the Wilberforce Library in 2016 with sustainability in mind. The building includes straw bale construction, a living roof, passive solar and heat pump technology.

Reduce-Improve-Switch[1] is an approach used for energy and emissions planning for buildings. Reducing GHG emissions from municipal buildings will involve both reducing the demand for energy and switching to low or zero carbon sources of energy. In most cases, the focus should first be on reducing energy demand before investing in alternative forms of energy.



FUEL SOURCE BY CONSUMPTION



FUEL SOURCE BY GHG EMISSIONS

BUILDINGS



REDUCE

Avoid the consumption of energy in the first place

IMPROVE

Perform energy retrofits

SWITCH

Shift to low carbon and renewable sources of energy

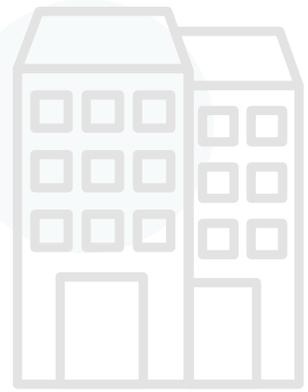
Reducing the demand for energy will involve creating a culture of energy conservation among municipal staff and implementing higher construction standards for new municipal buildings. Improving our municipal buildings and switching to low carbon and renewable energy options will first involve performing energy audits to determine cost-effective opportunities, and subsequently implementing the recommendations. Recommendations will be focused around improving building envelopes, lighting retrofits, HVAC replacements, building automation and the introduction of renewable energy. The recommended actions outlined in this section will be led by the Climate Change Coordinator with support from Administration, Fire, Parks and Recreation and Roads departments.

The Municipality spent \$256,000 in 2018 to heat and power municipal buildings. The carbon tax in Canada has the potential to gradually increase and reach \$210/tCO₂e in 2030 [2]. The Municipality could spend up to \$317,000 to heat and power buildings by 2030 [3], giving increased incentive to reduce energy consumption sooner rather than later.

GOALS

- Improve energy efficiency
- Transition to low carbon and renewable sources of energy

RECOMMENDED ACTIONS FOR BUILDINGS



Conduct energy audits on municipal facilities to identify retrofit opportunities, prioritizing those with the highest energy intensity or consumption. Ensure that energy audits consider renewable energy opportunities.

Timeline: Short

GHG Reduction Potential: Indirect

Cost: Moderate (\$19,000) [4]

Potential Funding: Natural Resources Canada Energy Manager Program; Energy Performance Contracts

Create a schedule and implement the recommendations from energy audits for actions that are deemed to have a reasonable payback period. Each building will have its own recommendations, including improving building envelopes, lighting retrofits, HVAC replacement, automation, renewables, etc.

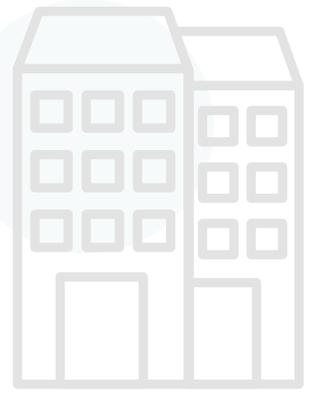
Timeline: Ongoing

GHG Reduction Potential: High

Cost: High

Potential Funding: Save on Energy; Green Municipal Fund; Energy Performance Contracts

RECOMMENDED ACTIONS FOR BUILDINGS



Implement a green building policy requiring higher construction standards for new municipal buildings. New builds should go beyond building code and consider lifecycle carbon emissions.

Timeline: Medium

GHG Reduction Potential: Avoids future growth in emissions

Cost: Premium of 2-7% [5]

Potential Funding: Green Municipal Fund

Continue staff education on reducing energy consumption.

Timeline: Ongoing

GHG Reduction Potential: Low

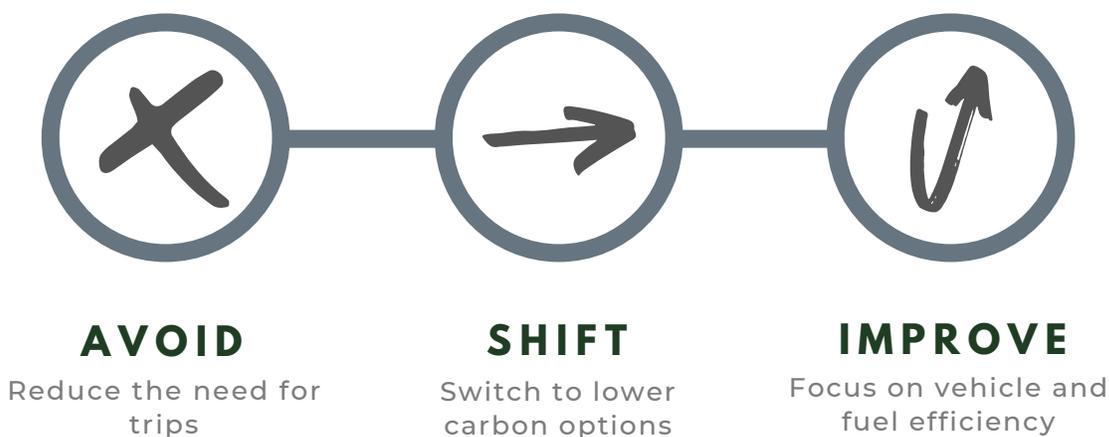
Cost: Nominal

FLEET

Municipal fleet includes equipment, light-duty and heavy-duty vehicles used for roads, fire, water and wastewater, parks and recreation, and planning. Municipal fleet produced 530 tCO₂e or 16% of corporate emissions in 2018. GHG emissions from municipal fleet result from the use of diesel (78%) and gasoline (22%). To reach an overall target of 15%, fleet emissions will need to be less than 450 tCO₂e in 2030.

The Avoid-Shift-Improve approach can be utilized to reduce emissions from fleet. Avoidance seeks to reduce the need for trips, which can be achieved through carpooling or route optimization. Switching refers to the shift to lower carbon options of transportation, such as replacing a gas-powered vehicle with an electric option. Improvement focuses on vehicle and fuel efficiency, which can be achieved through selecting the smallest size vehicle that meets the requirements.

Avoiding fuel consumption through reducing unnecessary idling time and optimizing driver behavior are able to reduce fuel consumption by 5-10% [6]. Vehicle tracking systems can be used to monitor progress in this area and incentives can be used to maintain motivation.



FLEET

The shift to lower carbon options for fleet will involve evaluating the needs of each vehicle upon replacement to determine if a vehicle can be right sized and/or replaced with a lower carbon option. The most promising action to reduce GHG emissions from fleet is electrification. Hybrid and electric options are available for a range of light-duty vehicles, with more options becoming available every year. While low emission vehicles will come at a cost premium, considering the entire lifecycle cost of a vehicle can demonstrate greater cost effectiveness. Heavy-duty fleet such as tandems, backhoes, graders and tractors will be limited as to what is available on the market, and will be a challenging area for reducing GHG emissions. The recommended actions outlined in this section will be led by the Climate Change Coordinator with support from the Administration, Environment, Fire and Roads departments.

The Municipality spent \$239,000 in 2018 to fuel the vehicle fleet. The federal carbon tax has the potential to gradually increase and reach \$210/tCO₂e in 2030. The Municipality has the potential to spend up to \$366,000 to fuel the vehicle fleet by 2030, giving increased incentive to reduce fuel consumption sooner rather than later.

GOALS

- Reduce fuel consumption
- Transition to low carbon vehicles and fuels

RECOMMENDED ACTIONS FOR FLEET



Install electric vehicle charging stations in municipal parking lots with prioritized use for municipal fleet

Timeline: Short

GHG Reduction Potential: Indirect

Cost: Low (\$5,000-\$8,000) [7]

Potential Funding: Natural Resources Canada Zero Emission Vehicle Infrastructure Program

Develop and implement a green fleet policy (purchase the lowest emission vehicle where cost effective, right-sizing, anti-idling, etc.)

Timeline: Short

GHG Reduction Potential: High

Cost: Medium (Premium of \$3,000-\$15,000 per vehicle for light duty fleet) [8]

Potential Funding: Municipalities for Climate Innovation Program

RECOMMENDED ACTIONS FOR FLEET



Implement fleet operator training for reducing fuel consumption (anti-idling, optimal driving behavior, etc.)

Timeline: Short

GHG Reduction Potential: Medium

Cost: Nominal

Resources: Natural Resources Canada Smart Driver Training

Monitor the feasibility of alternative fuel sources (ex. biodiesel and hydrogen)

Timeline: Medium-Long

GHG Reduction Potential: High

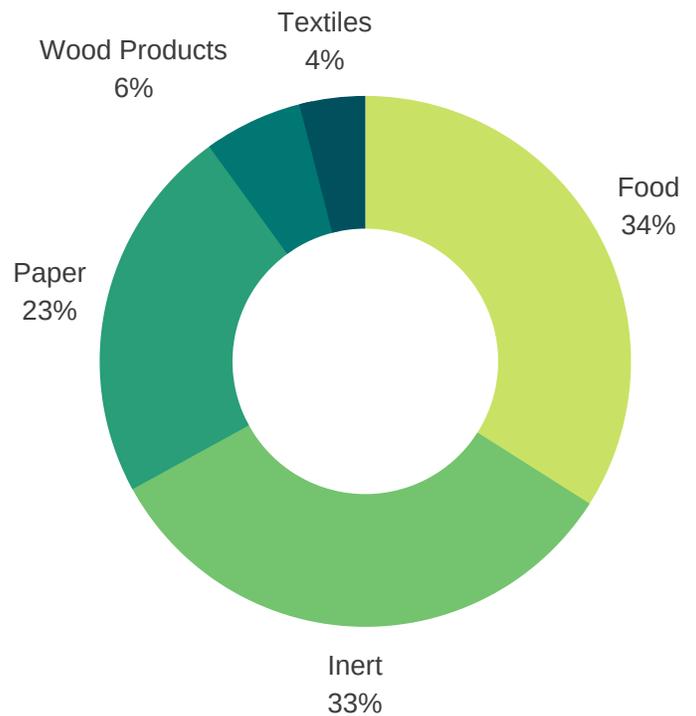
Cost: High

Potential Funding: Green Municipal Fund

WASTE

The Municipality operates four landfills (Bicroft, Highway 28, Mumford Road and Monmouth) and one transfer station (Glamorgan). The landfills produced 2,629 tCO₂e or 79% of corporate emissions in 2018. To reach an overall target of a 15% reduction in GHG emissions, landfill emissions will need to be less than 2,234 tCO₂e in 2030.

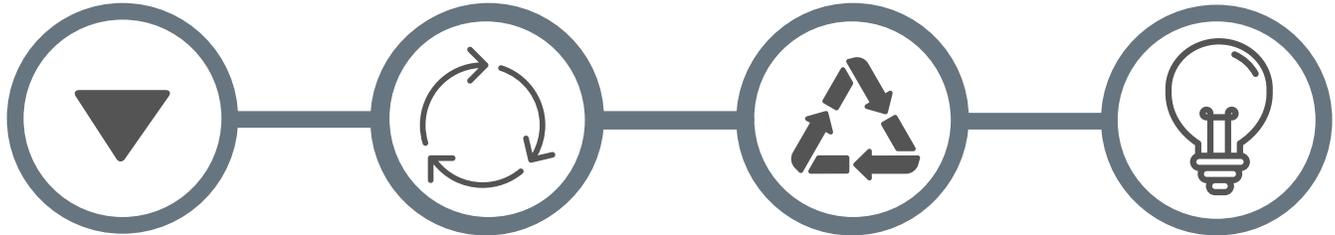
Organic waste that decomposes in an oxygen-free environment such as a landfill releases both carbon dioxide and methane. Methane is a GHG that is up to 34 times more powerful than carbon dioxide over a century. In an average municipal landfill in North America, waste is composed of food (34%), paper and cardboard (23%), wood products (6%), textiles (4%) and inert materials such as glass, metal and plastic (33%) [9]. Inert materials do not contribute directly to the landfill GHG emissions since they do not decompose.



AVERAGE MUNICIPAL WASTE COMPOSITION

The Municipality currently encourages waste diversion through requiring the use of clear bags for garbage, a two-stream blue box recycling program, electronics and battery recycling, household hazardous waste collection and composters and digesters available for sale to residents. The Municipality provides cottage kits that provide the necessary information and supplies for renters to properly dispose of waste, and a searchable database called the Waste Wizard which allows residents to search by item to easily determine the proper disposal method. The recommended future actions for waste will be led by the Climate Change Coordinator and the Environment, Administration and Parks and Recreation departments.

WASTE



REDUCE

Preventing the creation of waste altogether

REUSE

Using items more than one time or finding an alternative use for them

RECYCLE

Reprocessing waste to create a new product

RECOVER

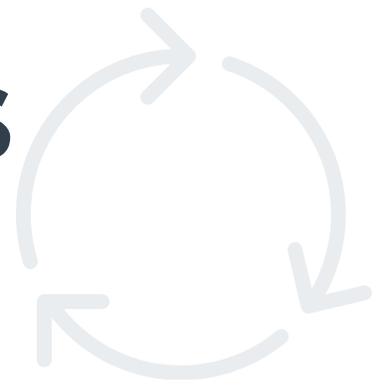
Converting waste into energy

The Municipality owns and operates the landfills, and thus has the power to implement policies and changes over landfill operations. While a small fraction of the waste comes from municipal facilities, the vast majority comes from the community. The Municipality can increase programs and policies for waste reduction and diversion, however success will ultimately be driven by decisions made by the community. Reducing landfill emissions involves following the 4 R's in order of importance: reduce, reuse, recycle and recover. The strategies that have the largest impact for reducing landfill emissions include recycling organic waste through composting and recovering landfill gas. These strategies are more difficult to implement in municipalities that have small landfill sites and quantities of waste.

GOALS

- Reduce and divert organic waste from landfills
- Improve corporate waste management
- Improve landfill data

RECOMMENDED ACTIONS FOR WASTE



Continue communication to residents and businesses on how to reduce and divert waste

Timeline: Ongoing

GHG Reduction Potential: Low (2-3%)

Cost: Low

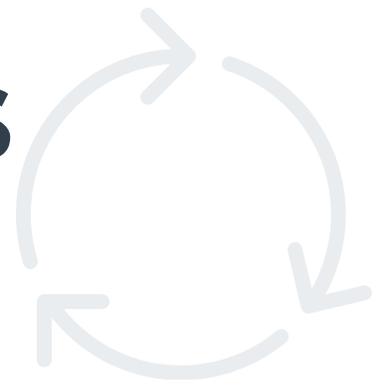
Expand options for re-use, including re-use centers at landfill sites

Timeline: Ongoing (In progress)

GHG Reduction Potential: Low (1-3%)

Cost: Low

RECOMMENDED ACTIONS FOR WASTE



Complete a waste composition study at landfill sites

Timeline: Short

GHG Reduction Potential: Indirect

Cost: Low to Moderate

Potential Funding: Continuous Improvement Fund

Potential Partnerships: U-Links

Conduct a waste audit of our corporate waste and implement strategies to reduce waste that is generated from municipal facilities

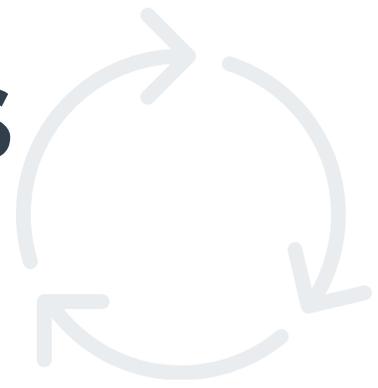
Timeline: Short

GHG Reduction Potential: Low (>1%)

Cost: Low

Potential Partnership: U-Links

RECOMMENDED ACTIONS FOR WASTE



Enhance the current backyard composting program

Timeline: Short

GHG Reduction Potential: Medium (5%)

Cost: Low to Moderate

Potential Funding: ECO Canada Student Work Placement Program

Explore the feasibility of introducing a reduced bag limit for garbage

Timeline: Medium

GHG Reduction Potential: Low (3-5%)

Cost: Nominal

RECOMMENDED ACTIONS FOR WASTE



Explore the potential of organics diversion for yard waste and food waste at landfill and/or community sites

Timeline: Medium-Long

GHG Reduction Potential: High (15-20%)

Cost: Variable depending on best solution

Potential Funding: Green Municipal Fund

Potential Partnerships: Neighbouring municipalities (Kawartha Lakes, Peterborough)

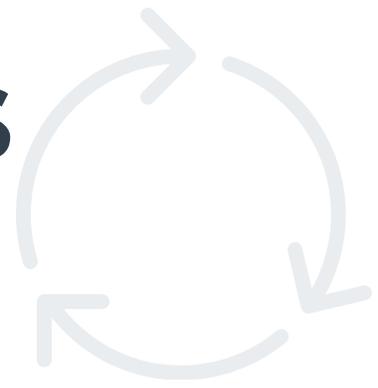
Increase source separation of waste in public areas (downtown, parks, etc.) with clear signage and appropriate lids to encourage proper sorting

Timeline: Long

GHG Reduction Potential: Low (1-3%)

Cost: Low

RECOMMENDED ACTIONS FOR WASTE



Explore the feasibility of landfill gas capture with potential energy generation

Timeline: Long

GHG Reduction Potential: High

Cost: High

Potential Funding: Green Municipal Fund

LEADERSHIP

To ensure the Municipality is considering the potential climate impacts when decisions are made, policies and processes will need to be re-focused to promote climate change mitigation. This can be achieved through highlighting GHG considerations in existing plans and policies or through the creation of new policies and tools. The Climate Change Coordinator will work with Department Heads to implement the recommended actions outlined in this section. The Municipality has incorporated climate mitigation considerations into existing plans, including:

Official Plan: Encourages and supports energy conservation, and alternative and renewable energy sources

Energy Conservation and Demand Management Plan: Identifies opportunities for energy improvement in municipal buildings and facilities

GOAL

- Integrate climate change considerations across municipal programs, policies and plans

RECOMMENDED ACTIONS FOR LEADERSHIP



Integrate comprehensive GHG and climate change considerations into municipal plans and policies (asset management plan, energy conservation and demand management plan, official plan, procurement policy)

Timeline: Short

GHG Reduction Potential: Indirect

Cost: Nominal

Incorporate a climate change lens into municipal decision-making (staff reports, RFPs, RFTs)

Timeline: Short

GHG Reduction Potential: Indirect

Cost: Nominal

FOOTNOTES

[1] Government of Ontario, Community Emissions Reduction Planning: A Guide for Ontario Municipalities, 2017.

[2] Canada's Ecofiscal Commission, Bridging the Gap: Real Options for Meeting Canada's 2030 GHG Target, 2019.

[3] Assumptions consider cost increases due to the carbon tax and estimated increases in energy consumption following the business-as-usual forecast. Does not consider changes to commodity prices.

[4] Assumes \$0.20 per ft² for 93,000ft² of Municipal buildings. Estimated from City of Prince George Energy and GHG Management Plan and U.S. Department of Energy Guide to Energy Audits.

[5] Environmental Protection Agency, State and Local Climate and Energy Program Rules of Thumb, 2016.

[6] Federation of Canadian Municipalities, Enviro-Fleets: Reducing Municipal Heavy-Duty Vehicle Emissions, 2010.

[7] For purchase and installation of a Level 2 (240V) station. Estimated from Plug In BC, Frequently Asked Questions and Partners in Project Green, Charge Up Ontario: A Guide for Businesses to Invest in Electric Vehicle Charging Stations.

[8] Assumes five fleet vehicles can be replaced with a low carbon option. Cost estimate from City of Waterloo Energy Conservation and Demand Management Plan and research on what is currently available on the market. Estimate does not account for cost savings from reduced fuel use.

[9] Federation of Canadian Municipalities and Local Governments for Sustainability, Partners for Climate Protection Protocol, 2014.