CORPORATE ENERGY CONSERVATION AND DEMAND MANAGEMENT PLAN

2024-2029

CITY OF BRAMPTON

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Executive Summary

As the urgency of global warming intensifies due to greenhouse gas (GHG) emissions, there is a growing emphasis on mitigating climate change to minimize its adverse effects. In response to this issue, in June 2019, the City of Brampton voted unanimously to declare a climate emergency, and has taken action to curb its GHG emissions. This Energy Conservation and Demand Management Plan (ECDMP) provides an overview of the City's current emissions and outlines a strategy to diminish its corporate contribution to GHG emissions. The goal is to achieve a reduction of 40-45% in emissions by 2030 (compared to a 2010 baseline) and ultimately attain net zero emissions by 2050. This is aligned with the federal targets to achieve a 40-45% reduction in GHG emissions by 2030 (compared to 2005 levels), and net zero by 2050.

This ECDMP recommends a set of strategies which comprise a Net Zero GHG Emission Reduction Roadmap. In the short term, the Net Zero Roadmap focuses on low-capital measures which the potential for sizable reductions in GHG emissions. In the medium and long term, the focus of this roadmap is on more capital-intensive measures with a potential for significant reductions in GHG emissions. The key strategies for the short, medium, and long term are presented below.

These strategies are aligned with the state of good repair for the City of Brampton, as where possible, the measure implementation timeline was chosen to match the end of useful life for any equipment which will be replaced by implementing this measure.

Short Term (2024-2029)

In the short term, the key strategies in the Net Zero GHG Emission Reduction Roadmap are:

- Lighting upgrades.
- Heating, ventilation, and air conditioning (HVAC) system optimization measures.
- Complete net zero retrofits at Susan Fennell Sportsplex and Earnscliffe Recreation Centre (in planning stage).
- Additional deep retrofit studies to identify additional opportunities to reduce GHG emissions.

Table 1 summarizes the proposed actions to be undertaken as part of the 2024-2029 ECDMP, and the corresponding GHG and cost savings.

Table 1: Summary of planned actions to undertake in the short term (2024-2029)

Facility	Action	Reduction in GHG emissions (tCO2e/yr)	Utility cost savings ($/yr)
Corporate Facilities (FOM)	New building	-296	-314,949
	Lighting upgrades	40	139,527
	HVAC system optimization	103	43,541
	Equipment electrification	56	-16,597
	Upgrades to heat pump	223	1,953
	Additional process upgrades	9	14,536
Fire Facilities	Lighting upgrades	3	10,561
	HVAC system optimization	15	4,302
Library Facilities	Lighting upgrades	4	15,063
	HVAC system optimization	26	7,147
Parks Facilities	Lighting upgrades	3	6,172
	HVAC system optimization	21	4,614
Recreation Facilities	Ongoing construction	0	0
	Building decommission	1	1,704
	Lighting upgrades	98	222,975
	HVAC system optimization	1,008	131,577
	Equipment electrification	165	-31,028
	Upgrades to heat pump	687	78,457
	Envelope upgrades	143	33,553
	Solar PV	248	396,106

Table 1: Summary of planned actions to undertake in the short term (2024-2029) *(continued)*

Facility	Action	Reduction in GHG emissions (tCO2e/yr)	Utility cost savings ($/yr)
	Additional process upgrades	482	185,150
	Purchasing carbon offsets	3,150	-77,264
Transit Facilities	Lighting upgrades	12	44,685
	HVAC system optimization	177	51,729
	Purchasing carbon offsets	4,754	-116,618

Note that a negative ("-") reduction in GHG emissions indicates that the City's GHG emissions are anticipated to increase for that measure, although overall energy use would decrease. Also note that the measures associated with the net zero retrofits are being accounted for in the recreation measures.

The 5-year vision of this plan would entail a reduction in electricity consumption of **6%** and natural gas consumption of **8%**. To achieve the target of a 40-45% reduction in GHG emissions by 2030, it is recommended that the City of Brampton purchase carbon offsets for the four largest contributors to GHG emissions, the Brampton Transit Yard Sandalwood Facility, the Brampton Transit Yard 185 Clark Blvd, the Gore Meadows Community Centre, and the Susan Fennel Sportsplex. This will offset 7240 tCO2e/yr, and will result in a cumulative GHG reduction of **41%** from 2010 by 2029. The recommended measures are also anticipated to decrease the annual utility costs by $1,553,237, or **8%**.

Medium Term (2030-2035) and Long Term (2035-2050)

In the medium and long term, the key strategies in the Net Zero GHG Emission Reduction Roadmap are:

- HVAC equipment to heat pumps.
- Domestic hot water heaters to heat pumps.
- Installation of solar PV (photovoltaic) arrays.
- Replace gas-fired equipment with electric equipment.
- Develop a policy to ensure that new builds are designed to have net zero or near net zero emissions (similar to the City of Toronto's Zero Emissions Buildings Framework) to avoid a significant increase in the City's GHG portfolio when new buildings are constructed.

Based on the recommendations in this net zero pathway, the City can decrease their GHG emissions by about **97%** without purchasing carbon offsets. Once the effects of offsets to meet its goals are factored in, the City of Brampton's GHG emissions are projected to decrease by **68%** by 2035 and **100%** by 2050. Carbon offsets are employed only as a last resort to offset remaining GHGs which cannot be fully eliminated in order to meet the City's goal of net zero by 2050. Additionally, it should be noted that as more organizations adopt carbon offsets to meet their GHG reduction targets, the cost of purchasing carbon offsets may increase. The quantity of carbon offsets required in 2050 could change depending on the electricity grid intensity at that time.

Progress Summary

Figure 1 summarizes the City's current emissions (in blue) and projected progress (green) in decreasing their GHG emissions, per the Net Zero GHG Emission Reduction Roadmap.

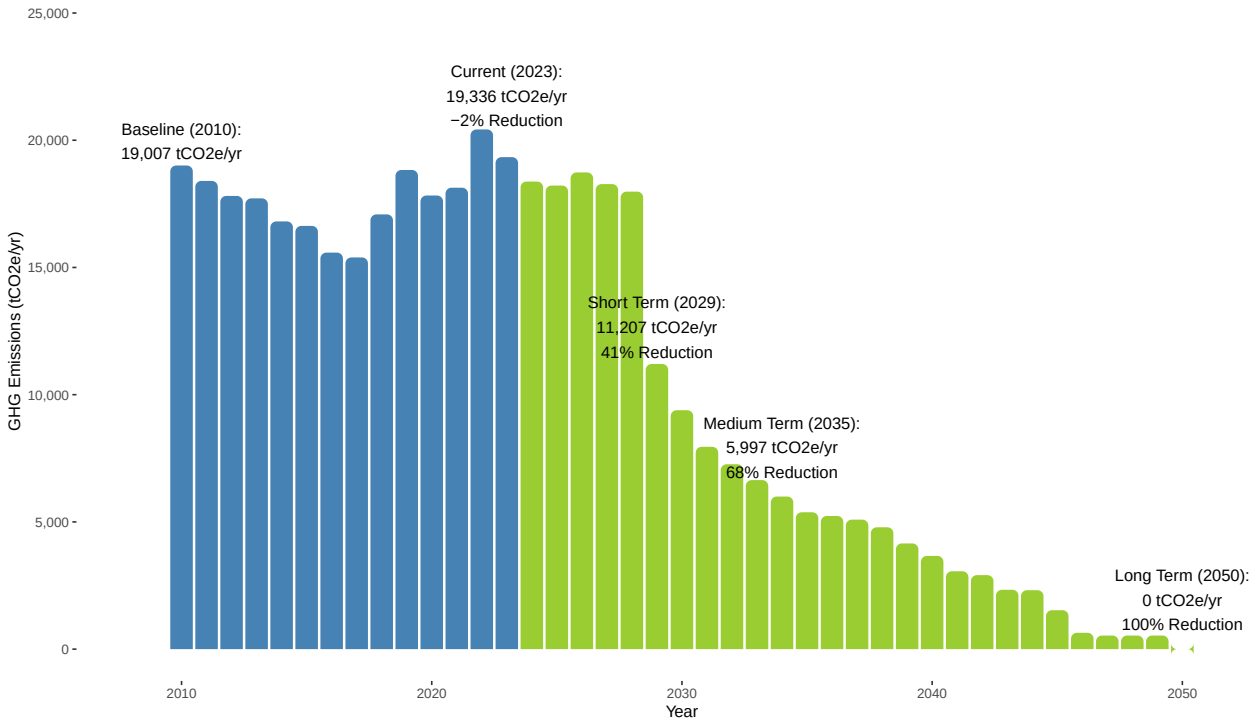

Figure 1: Projected reduction in GHG emissions at the end of each term.

To ensure that the City of Brampton is staying on track to meet their goals, it is recommended that the City continuously monitor and analyze utility use data for their facilities. The City is currently using Ameresco's AssetPlanner for Utility Data Management and annual BPS reporting to track utility use data. When the City implements measures at any facility, the utility consumption at that facility should be analyzed to ensure that the projected utility and savings are being achieved. This will allow the City of Brampton to investigate if the measure does not result in the savings that they expect, and take action as needed to stay on track with their GHG reduction targets.

Funding Opportunities

To support the implementation of short, medium, and long term strategies, the City of Brampton can leverage initiatives such as the Clean Fuel Regulations (CFR) credits and carbon trading schemes to secure financial resources for retrofitting projects and the purchase of carbon offsets. By participating in these programs, the City can generate revenue or reduce costs associated with GHG reduction measures. Furthermore, federal, provincial, and municipal funding programs offer grants and incentives for energy conservation projects and the adoption of renewable energy systems. For instance, in the short term, programs such as Enbridge's Retrofits & Custom Projects Rebate can be used to offset the costs of HVAC optimization projects. In the medium and long term, the Federation of Canadian Municipalities Green Municipal Fund offers several programs to offset the costs of energy conservation projects, such as the GHG Reduction Pathway Retrofit program. These funding strategies will play a crucial role in enabling the City to achieve its ambitious GHG reduction targets by alleviating the financial burden of implementing energy efficiency measures, renewable energy installations, and other capital-intensive projects. By proactively seeking and utilizing these funding opportunities, the City of Brampton can accelerate its transition towards a sustainable and resilient future.