To:	COUNCIL
Meeting Date:	**7/22/2025**
Subject:	**Greenhouse Gas Emissions Reduction Feasibility Study**
Submitted By:	Cheryl Zahnleiter, Deputy City Manager - Corporate Enterprise
Prepared By:	Ryan Hoeksma, Energy and Sustainability Specialist
Report No.:	25-006-CRE
File No.:	C11
Wards Affected:	All Wards

RECOMMENDATION(S):

THAT Report 25-006-CRE Greenhouse Gas Emissions Reduction Feasibility Study be received;

AND THAT the implementation of the Study be referred to the annual business planning and budget processes.

EXECUTIVE SUMMARY:

Purpose

The Greenhouse Gas (GHG) Emissions Reduction Feasibility Study ("The Study") was undertaken to provide the City with a clear, detailed pathway for reducing GHG emissions at its 10 highest-emitting facilities. The attached GHG Reduction Feasibility Study Executive Summary ("Executive Summary") report provides a high-level overview of the collective findings across these sites. This report serves as a report back on the conclusion of the project, as well as a recommended pathway for implementation.

Key Findings

After analyzing a number of scenarios (each with different selections of measures and timelines of implementation), the consultant has recommended that the City pursue the Federation of Canadian Municipalities (FCM) Minimum Performance scenario option at all 10 sites. This scenario aims to align with existing capital renewal timelines wherever possible while still prioritizing the 50% GHG emissions reduction in 10 years and 80% reduction in 20 years (vs 2023 baseline level of 1,792 tons carbon dioxide equivalent, or

tco2e), resulting in the most cost-effective pathway to reaching the emission reduction targets.

Financial Implications

The Business as Usual scenario, where equipment replacements are strictly like-for-like and no other GHG emission reducing measures are undertaken, results in a life cycle cost of approximately $36.6 million by 2050. The recommended FCM Minimum Performance scenario by comparison has a life cycle cost of approximately $50.7 million by 2050, a premium of approximately $14.1 million over the course of 25 years.

It should be noted that having completed The Study, the City is now eligible to apply for funding to assist with the implementation of the recommended measures through the FCM's Community Buildings Retrofit (CBR) program, which is an award of up to $10 million, 25% of which would be awarded as a grant and the remainder as a loan. Upon approval of this report, staff would be integrating the pathway components into the annual business planning and budget processes.

STRATEGIC ALIGNMENT:

☒ Strategic Action

Objective(s): RESILIENCY - Use a future-oriented, proactive approach to climate action and emergency preparedness

Strategic Action: Take action to combat climate change

OR

☐ Core Service

Program: Not Applicable

Core Service: Not Applicable

The Study undertaken provides the City with a clear pathway to reduce GHG emissions at its 10 highest-emitting sites. This is in alignment with both the City's Climate Emergency Declaration of 2019 and its Strategic Action of taking action to combat climate change.

Analyzing the available options and making an informed plan is the first step to reducing emissions. The measures and recommendations presented in The Study will inform the

City's renewal and capital planning for GHG-reduction and energy-saving projects over the next decade and beyond.

BACKGROUND:

On November 19 2019 City Council declared a Climate Emergency, and in alignment with the Region of Waterloo municipalities committed to reduce its corporate GHG emissions by 80% by 2050 (vs 2010 levels).

This commitment was echoed in the City's 2020 update of its Energy Conservation and Demand Management (ECDM) Plan, which received Council approval December 15 2020. The ECDM Plan delved into departmental GHG emissions and laid out several specific initiatives (example: item B3 - Developing a decarbonization plan for buildings and facilities - which The Study addresses).

In order to develop the decarbonization plan, the City created a capital project to study its 10 highest-emitting buildings. The City was successful in obtaining grant funding from the Federation of Canadian Municipalities to support this project. The consultant has completed the study work and this report requests Council's endorsement to refer the GHG reduction pathway to the annual business planning and budget processes for implementation in future years.

ANALYSIS:

Following extensive site investigations, air tightness testing, energy modelling, and design workshops with the City's project team and staff from each facility, the consultant has produced 147 possible GHG-reducing measures across the 10 sites. Sites include City Hall, David Durward Centre / Centre for the Arts, Allan Reuter Centre / Fire Station 3, WG Johnson Centre, Galt Arena Gardens, Hespeler Memorial Arena, Duncan McIntosh Arena, Dickson Arena, Bishop Operations Centre and Queens Square library. An Executive Summary of the study is attached to this report as Appendix A.

Various clusters of measures and their financial and emissions-related impacts over various time spans were analyzed for each site. The consultant found that for each site the FCM Minimum Performance scenario proved to be the best overall pathway for the City in terms of cost vs performance while achieving the program's target outcomes. Specific measures provided for each facility can be found in the full study (which is well over 1,000 pages in length and is therefore being made available upon request).

The highest impact measures are typically those that would be labelled as "fuel-switching," whereby natural gas-fired space and water heating equipment is replaced with electric powered equipment. This strategy is very effective at reducing operational GHG emissions because of the high emission intensity of natural gas vs the Ontario

electricity grid, as well as the general superior efficiency of electric powered equipment. In many cases natural gas may still be utilized to help meet peak heating demands during stretches of extreme cold weather.

The recommended FCM Minimum Performance scenario pathway aims to maximize the use of the existing equipment in these buildings before calling for replacements - while prioritizing meeting the program's emissions targets - using the greatest impact to lowest capital investment measures identified. Across the 10 observed sites this approach would result in a total life cycle cost of ~$50.7 million (vs ~$36.6 million in a Business as Usual scenario) by 2050. The impact on GHG emissions at these sites will be a reduction vs 2023 baseline levels of 50% by 2033 and 80% by 2043, the equivalent of avoiding ~1,434 tco2e annually by 2043. It should also be noted that given the extent of the proposed electrification of these sites, emissions would be expected to continue dropping beyond 2043 as the provincial grid approaches carbon neutrality (estimated to be achieved by 2050).

EXISTING POLICY / BY-LAW(S):

There is no existing policy/by-law.

FINANCIAL IMPACT:

The current recommendation is only for Council to receive the GHG Emissions Reduction Feasibility Study Executive Summary and to refer the implementation to the annual business planning and budget processes, for consideration in the capital plan and forecast. $200,000 of the $300,000 cost of this study was provided as a grant from the FCM, with the remainder coming from the City's Capital Works Reserve Fund.

Within The Study the consultant advises that at the selected sites the FCM Minimum Performance scenario is the most cost-effective pathway for the City to reach the desired reduction levels. This scenario would imply a $14.1 million life cycle cost premium vs the Business as Usual scenario ($50.7 million vs $36.6 million between now and 2050 across the 10 observed sites). This life cycle costing considers inflation, projected utility costs, capital costs and federal carbon charges.

Having completed The Study, the City is eligible to apply for further funding through the FCM's CBR program, which would provide up to a $7.5 million loan and a $2.5 million grant to implement the recommended measures.

PUBLIC VALUE:

Sustainability:

This study is the first necessary step in moving towards a lower emissions future for the City's building portfolio. The undertaking of this study supports sustainability by giving the City a clear picture of how it can move forward and take concrete steps towards achieving its stated GHG emission reduction targets. It also makes the City eligible for an FCM grant and loan program designed to help municipalities implement the measures recommended in the study, making these projects more feasible and more likely to materialize.

ADVISORY COMMITTEE INPUT:

Not applicable

PUBLIC INPUT:

Public Information Centres (PICs)

Prior to the conclusion of The Study, the City's Project Manager and the consultant hosted 5 PICs (at Galt Arena Gardens, Queens Square library, WG Johnson Centre, City Hall and Allan Reuter Centre) to give the public a chance to learn about the study, discuss what measures were being recommended where, and to ask any questions or voice any concerns they have.

INTERNAL / EXTERNAL CONSULTATION:

Relevant staff at each site were involved in both the site audits and the two design workshops run by the consultant for each site. Site supervisors' (and in many cases their operations staff) participation in discussions at these workshops provided invaluable insights and feedback as the consultant worked to understand the operation, uses and constraints of the buildings, as well as impressions of the measures being proposed.

Staff at the Queens Square library were engaged in the same way the supervisors and their staff were at City-operated facilities, and their participation was equally valuable and appreciated.

CONCLUSION:

The Study represents an important first step towards addressing the climate emergency at a municipal level, which the City is committed to. It provides the City with the data

and guidance it requires for assessing options for the next steps in reducing GHG emissions at its 10 highest-emitting facilities, and enables it to apply for further funding to aid in the implementation of the measures recommended in the study through the FCM's CBR program.

This work is in alignment with the City's Climate Emergency Declaration of 2019, its 2020 Energy Conservation and Demand Management Plan and its Strategic Plan Action of taking action to combat climate change.

REPORT IMPACTS:

Agreement: **No**

By-law: **No**

Budget Amendment: **No**

Policy: **No**

APPROVALS:

This report has gone through the appropriate workflow and has been reviewed and or approved by the following as required:

Director

Deputy City Manager

Chief Financial Officer

City Solicitor

City Manager

ATTACHMENTS:

1. 25-006-CRE Appendix A – Greenhouse Gas Emissions Reduction Feasibility Study Executive Summary