Staff Report

To	General Committee
Subject	Corporate Net-Zero Strategy 2025-2050
Date	April 2, 2025
Ward	All
From	R. Pews, P.Eng; Director of Corporate Facilities
Executive Member Approval	J. Schmidt; General Manager of Community and Corporate Services.
CAO Approval	M. Prowse, Chief Administrative Officer
Staff Report #	FAC003-25

Recommendation(s):

1. That the Corporate Net Zero Strategy attached as appendix A to Staff Report FAC003-25 be endorsed in principle.

2. That low-carbon alternatives be evaluated as part of the standard capital planning process for all assets.

3. That low-carbon options be recommended when renewing energy-consuming corporate assets in capital planning and budgeting, when lifecycle payback offsets the incremental cost.

4. That all new facilities be designed and constructed to meet a net-zero energy standard, aiming to generate as much renewable energy as they consume from low-carbon sources, where the incremental cost is offset by lifecycle payback as part of the annual capital planning and budgeting process.

5. That all internal combustion engine (ICE) vehicles be replaced with electric vehicle (EV) equivalents, typically at end of life, and when feasible, considering the availability of suitable EV models, operational requirements, and the infrastructure needed to support electric vehicles.

6. That renewable energy assets be deployed when they provide a positive return on investment, and that authority be delegated to the Director of Corporate Facilities to execute or modify agreements related to regulatory approvals for these assets.

7. That the prioritization of low-carbon options be approved in situations where equipment failure necessitates immediate replacement under the City's emergency procurement provisions, whenever technically feasible.

8. That staff in the Corporate Facilities Department present a progress report annually to General Committee concerning the Corporate Net Zero Strategy.

Executive Summary:

The purpose of this staff report is to seek endorsement in principle for a Corporate Net Zero (NZ0) Strategy that follows an asset-based renewal approach, replacing energy-consuming and greenhouse gas-emitting assets with low-carbon alternatives as they reach the end of their lifecycle.

Staff recommend the endorsement of low-carbon initiatives when they present a positive financial business case for the corporation. These initiatives include:

- Renewal of existing energy consuming assets
- Construction of new facilities and energy intensive infrastructure
- Deployment of renewable energy generating assets.

Key Findings:

In 2019, Council declared a climate emergency which included in part, direction to staff to investigate the development of a corporate net zero strategy.

Staff have developed a strategy addressing corporate GHG emissions from services and assets under the corporation's control, including energy-consuming assets (facilities, vehicles) and biogas emissions from wastewater operations and the Waste Disposal Site. The emissions inventory complies with recognized municipal accounting standards.

The NZ0 Pathway utilizes an asset management framework that focuses on transitioning to low-carbon alternatives as City assets reach the end of their useful life. This framework relies on a thorough analysis of the City's operations at the asset level to assess initial capital costs, life cycle cost savings, and potential GHG emission reduction.

Under the NZ0 Pathway, GHG emissions are projected to decrease by 53% relative to the baseline year (2022), reaching 18,200 tonnes CO_2e annually by 2050. The greatest opportunities for reduction come from switching fuels, replacing fossil fuels with electricity to power building heating systems and fuel its fleet and transit vehicles.

The strategy provides a pathway for the corporation to achieve net zero emissions by 2050. To ensure its practicality and feasibility, staff considered technical constraints, regulatory limitations, and financial factors during its development. Low-carbon strategies that exceeded these limitations were excluded from the final recommended pathway analysis.

Achieving successful implementation of the strategy or NZ0 pathway requires integrating low-carbon actions into the corporation's daily operations. As outlined in the strategy, this will be accomplished by revising the capital planning process to assess low-carbon options, incorporating net zero pathway considerations into relevant master plans, asset plans, and operational plans, continuing to optimize energy efficiency efforts, and monitoring and reporting progress toward the net zero pathway.

Financial Implications:

Plan Implementation

It is important to note that achieving net-zero emissions will incur costs, but these will vary depending on the specific measures implemented. Any future financial decisions related to this strategy will be presented to Council through the standard business process for approval. There are financial implications and investment requirements needed to implement the net zero strategy. These investments can be categorized into three types:

a. **Non-Recoupable Investment:** This category includes low carbon activities that do not result in cost savings or cost avoidance, such as purchasing carbon credits.
b. **Partially Offsetting Investment:** This category includes solutions with higher costs and modest savings that do not fully offset the additional expenditure. These actions typically have fairly significant capital premium costs compared to the business-as-usual option.
c. **Payback Driven Investment:** Some low-carbon solutions are inexpensive to implement and generate cost savings through improved operational efficiency, while others require a higher initial investment that can be offset by long-term operational savings.

Endorsing this strategy in principle does not incur immediate direct financial costs. This staff report is requesting endorsement that supports implementation of low-carbon options that are classified as Payback-Driven Investments, which are expected to deliver positive financial benefits to the corporation. The NZ0 Strategy estimates the incremental capital costs, if any, associated with implementing the low-carbon pathway, along with potential energy cost savings from these actions. This analysis provides a snapshot based on current factors influencing these costs, such as commodity prices, inflation, and construction expenses. Under the asset management NZ0 renewal framework, these parameters are continuously updated as assets are renewed, ensuring alignment with existing conditions and best practices.

Future implementation activities, including any studies, feasibility analysis or low carbon capital investments that do not demonstrate a payback, will be presented as part of the annual business planning process or through direct requests to Council.

Plan Development Costs, Grants & Cost Avoidance

The NZ0 Pathway strategy was developed internally, supported by engineering studies of nine of the City's largest emitting facilities, a renewable energy portfolio analysis, and investigation of the potential future electrification requirements needed to support electrified transit buses and fleet.

Developing this plan in-house resulted in significant cost savings for the city, including an estimated $125,000 in consulting fees and $10,000 in design costs. Additionally, staff from the Environmental Management Branch (EMB) successfully secured a $200,000 grant from the Federation of Canadian Municipalities (FCM) Green Municipal Fund that supported the net zero building engineering studies.

Alternatives:

The following alternatives are available for consideration by General Committee:

Alternative #1 – General Committee receive the report and take no action.

This alternative is not recommended. Endorsement of the NZ0 Strategy, in principle, is necessary to demonstrate leadership on climate action and realize potential cost savings associated with implementation of low-carbon alternative pathways

Strategic Plan Alignment:

The recommendations included in this Report relate to one key goal identified in the 2022-2026 Strategic Plan.

Infrastructure Investments	X	The NZ0 Strategy provides a pathway for implementing climate action plans, a key requirement outlined in the Infrastructure Investment portion of the Strategic Plan.

Additional Background Information and Analysis:

This section provides an overview of the key elements of the net-zero strategy, including the GHG emissions inventory, the business-as-usual trajectory, the net-zero pathway, and implementation considerations.

Energy & GHG Emissions Inventory

The Net-Zero Strategy uses 2022 as the baseline year for GHG emissions and follows recognized accounting standards such as the PCP Protocol and the Global Protocol for Community-Scale GHG Inventories (GPC). The 2022 inventory includes emissions from energy use across City operations, biogas from the Sandy Hollow Landfill, and biogas combustion at the Wastewater Treatment Facility. Future updates may include Scope 3 emission sources, including contractor travel, supply chain, and additional wastewater treatment process emission sources.

In 2022, the City's operations generated a total of 38,500 tonnes of CO_2e GHG emissions, representing roughly 4 percent of the community's overall GHG emissions. The largest source of these emissions, accounting for 61 percent of the total (23,600 tonnes CO_2e), comes from solid waste deposited at the Sandy Hollow Landfill.

Business-as-Usual Pathway

A business-as-usual (BAU) GHG emission pathway projects future emissions based on current trends, practices, and known plans, assuming no significant changes in policies, technologies, or behaviours. It serves as a reference scenario, offering a forecast of what emissions could look like if the city continues its existing activities without implementing new measures to reduce emissions.

For the Corporation, the BAU pathway projects a 6% increase in emissions, which would result in a total of 40,100 tonnes CO_2e annually by 2050. This projection reflects the continued reliance on current systems and operations without any transformative changes to address climate goals.

The GHG emission trend is also significantly influenced by accounting protocols for solid waste emissions. Under the BAU Pathway, the city-owned landfill is assumed to be closed in 2035 and that solid waste will be exported outside the City's boundary which impacts how GHG emissions from the community's waste is reported.

The BAU pathway forecasts a 98% increase in energy demand by 2050, leading to a 217% increase in energy costs, from $12 million in 2022 to $37 million by 2050. Without the implementation of significant improvements in energy management or the adoption of climate mitigation measures, these trends are expected to persist.

Approach to Net-Zero

The NZ0 Pathway adopts an asset management approach, transitioning to low-carbon alternatives as assets reach the end of their useful life. By analyzing operations at the asset level, the NZ0 Pathway provides a data-driven approach to net-zero, that can best

guide decision-making while balancing the City's financial and emission reduction goals.

The NZ0 Strategy outlines a set of strategies for each Operational Group, based on achievable reductions informed by the asset level analysis. These strategies are grouped into a tiered structure, starting with cost-effective solutions and moving toward those requiring higher initial capital investments. This approach ensures that financial considerations are integrated with GHG reduction goals. By organizing the strategies in this manner, the NZ0 Strategy supports consistent, coordinated implementation across all Operational Groups and aligns with the City's long-term net-zero objectives.

Net-Zero Pathway

The NZ0 Pathway identifies four strategies that can be applied across the corporate operations. These strategies are implemented using a tiered approach, following a structured, step-by-step process that prioritizes lower-cost, high-impact actions first, followed by higher-investment, capital-intensive activities. These include, in order:

a. **Optimization:** Focusing on ensuring existing systems and processes operate at maximum efficiency. Optimization is prioritized as the first action because it requires minimal initial investment while delivering reductions in GHG emissions.
b. **Fuel Switching:** Transitioning to low-carbon energy sources from fossil fuels.
c. **Equipment Upgrades:** Transitioning to more energy-efficient equipment models. While this may not involve a fuel switch, it offers significant potential for reducing overall energy consumption.
d. **Renewable Energy:** Maximizing the deployment and utilization of solar photovoltaic systems to reduce grid electricity emissions and lower hydro costs.

Under the NZ0 Pathway, using these strategies GHG emissions are projected to decrease by 53% relative to the baseline year, reaching 18,600 tonnes CO_2e annually by 2050.

The projected reductions in energy use across these operational groups will also result in substantial energy cost savings. By 2050, the NZ0 Pathway, if fully implemented, is expected to generate an estimated annual cost savings of approximately $12 million compared to the BAU Pathway.

Corporate-Wide Solutions

The NZ0 Strategy consists of two primary sets of strategies. The first set, developed in consultation with each Operational Group, outlines specific actions across all assets that contribute to GHG emissions. The second set focuses on addressing remaining GHG emissions at a Corporate-wide level.

To eliminate emissions from electricity consumption, the strategy recommends meeting the Corporation's remaining electricity needs through a large-scale renewable energy project. For residual emissions from fossil fuels and biogas, the strategy suggests offsetting through nature-based solutions, particularly enhancing carbon sequestration in the City's parks and natural areas. Carbon offsets may also be considered to fully mitigate any remaining emissions

NZ0 Strategy Implementation

Net-zero objectives will be integrated into the City's capital planning and renewal framework, with a focus on an inclusion and evaluation of low-carbon alternatives. Low-carbon options that demonstrate a life cycle payback will be incorporated as standard business-as-usual solutions. Conversely, where substantial initial capital investment is required without a projected return on investment, such items will be explicitly highlighted for Council's consideration.

The NZ0 Strategy will be executed through a collaborative effort between the EMB and the Operational Groups, ensuring alignment with the City's net-zero goals. Each group will be guided by an annual carbon budget, informed by the NZ0 Pathway, to help track progress. Successful implementation will be supported by integrating net-zero strategies into existing policies, ensuring consistent and effective execution across all departments.

Data monitoring and plan reporting will support the asset-based approach by emphasizing evidence-driven decision-making, using accurate data to guide planning and actions. Regular progress updates will maintain momentum, recognize successes, and identify areas for improvement, ensuring continuous progress toward long-term goals.

Consultation and Engagement:

A Net-Zero Facility Feasibility Study was conducted by an engineering consulting firm for nine of the City's largest GHG emitting buildings. Key internal stakeholders were engaged through on-site assessments, staff interviews, energy system reviews, and workshops.

The development of the Net-Zero Strategy involved consultation with internal working groups. Staff from the following departments were consulted: Corporate Asset Management, Corporate Facility Services, Facility Planning & Development, Parks and Forestry, Recreation and Culture Services, Transit and Parking Strategy, Waste Management and Environmental Sustainability, Wastewater Operations, and Water Operations.

Environmental and Climate Change Impact Matters:

The following environmental and climate change impact matters have been considered in the development of the recommendation:

a. Endorsing the NZ0 Strategy will enable future climate change mitigation action and reducing GHG emissions from the City's operations.

Appendix:

Appendix A – Corporate Net-Zero Strategy, 2025-2050

Report Author:

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