Staff Report for Committee of the Whole Meeting

Date of Meeting: November 20, 2024
Report Number: SRCS.24.16

Department: Community Services
Division: Public Works Operation

Subject: SRCS.24.16 - 2024-2029 Corporate Energy Plan

Purpose:

To provide an overview of the 5-year update to the City's Corporate Energy Plan; and to seek Council approval to implement measures and targets recommended by the plan.

Recommendation(s):

a) That staff report SRCS 24.16 be received,

b) That the 2024 Corporate Energy Plan be endorsed and implementation of recommended energy efficiency and net zero carbon measures be brought forward for approval through the budget process, and

c) That the energy efficiency and GHG emissions targets for new City facilities and major retrofits, as described in the 2024 Corporate Energy Plan, be adopted.

Contact Person(s):

- Vlad Gaiu, Manager, Energy & Waste, Extension 2524
- Frank Quarisa, Director, Public Works Operations, Extension 2935
- Nick Kalyvas, Director, Facility Management, Extension 2522
- Tracey Steele, Commissioner, Community Services, Extension 2476

Report Approval:

All reports are electronically reviewed and/or approved by the Division Director, Treasurer (as required), City Solicitor (as required), Commissioner, and City Manager. Details of the reports approval are attached.

Key Messages:

- The City's Corporate Energy Plan is being updated. The new plan reflects Council's previously approved target of net zero carbon emission by 2050 for City facilities.
- The Corporate Energy Plan includes 85 energy conservation and carbon reduction measures to be implemented over the next five years.
- The cost to decarbonize City facilities is significant. The recommended measures are prioritized based on life cycle costs and GHG emissions reduction potential.
- Allocation of funds for implementation of the CEP is necessary to ensure that progress continues towards Council's target of Net Zero emissions by 2050.
- Energy efficiency and GHG emissions targets for new City facilities have also been recommended in the plan.

Background:

The City of Richmond Hill operates and maintains 60 facilities including community centres, pools, arenas, libraries, and administrative buildings. These facilities consume a significant amount of energy, costing approximately $4.3 million per year, and emitting 6,300 tonnes of greenhouse gas (GHG) emissions annually.

Ontario Regulation 25/23, under the *Electricity Act,* requires municipalities to develop and publish an energy conservation and demand management plan (Corporate Energy Plan) and update it every five years. Richmond Hill developed its first Corporate Energy Plan (CEP) in 2014, which was subsequently updated in 2019. The objective of the CEP is to manage and reduce municipal energy consumption, costs and GHG emissions, through energy conservation initiatives and renewable energy systems.

The updated 2024-2029 Corporate Energy Plan will guide the City's energy management and GHG emissions reduction efforts over the next five years. Unlike previous plans, which focused on energy conservation, the focus of this plan is shifting to GHG emissions reduction, to align with the Council approved target of net zero GHG emissions for the entire City of Richmond Hill by 2050, as per the City's Community Energy and Emissions Plan (2021). The CEP details the measures to be implemented over the next five years, along with the expected energy, costs and GHG emissions reductions.

The purpose of this report is to provide an overview of the updated Corporate Energy Plan (Appendix A: 2024-2029 Corporate Energy Plan); and to seek Council's endorsement of the updated Corporate Energy Plan and energy efficiency targets for new City facilities and major retrofits.

Discussion:

Implementation results from the previous Corporate Energy Plan (2019 -2023)

The previous version for the Corporate Energy Plan (2019 - 2023) was informed by detailed energy audits of the City's largest facilities. Staff prioritized 62 energy conservation measures recommended by the energy audits. Half of these measures have been implemented or are currently underway. In addition, 13 lifecycle driven equipment replacement projects, with energy savings potential, have been completed or are underway. The implementation of these energy conservation measures resulted in approximately a 3.4% reduction in energy consumption, which is equivalent to $273,000 per year in energy cost avoidance and a reduction in GHG emissions of 128 tonnes per year. As a result, the energy use intensity[1] (EUI) target set by the previous CEP was achieved. To offset the capital cost of implementing the energy conservation projects, staff secured over $200,000 in incentive funding from Provincial programs. The energy conservation projects that could not be implemented in the previous plan, were reassessed, and added to this CEP update for implementation.

2024-2029 Corporate Energy Plan

In preparation for the 2024 update to the CEP, net zero feasibility studies[2] were conducted for five City facilities (two pools, one ice rink, the theater and one operations facility). These net zero studies recommended GHG reduction measures and actionable pathways to achieve net zero GHG emissions by 2050 at City facilities. The recommended measures included energy conservation, fuel switching/electrification (i.e. switching from natural gas to electrical heating) and renewable energy measures. Staff prioritized 34 of the recommended measures based on life cycle costs and GHG emissions reduction potential.

Since the cost to decarbonize City facilities is significant, the most financially sustainable path forward, is to implement capital intensive measures only when the existing equipment reaches its end of life. This asset management approach reduces wasted investments on assets replaced before their expected end of life and means that the City will only incur the incremental cost of the low carbon measure over the business-as-usual option.

The 2024 to 2029 Corporate Energy Plan also includes unimplemented measures carried over from the previous plan and measures recommended by recently completed building recommissioning studies. Energy conservation measures that were successfully implemented in the past and should be considered for replication in other similar facilities as part of larger renovation projects are also captured. In addition to capital energy conservation and net zero measures, operational and organizational measures have been recommended in the plan. Operational measures include

[1] Energy Use Intensity (EUI) represents the energy consumption per square foot of building space.
[2] 80% of the study cost was covered by Federation of Canadian Municipalities (FCM) under its Community Building Retrofit (CBR) initiative, administered through Green Municipal Fund (GMF).

maintaining pool and ice rink temperature set points within an optimal range, that still provides occupant comfort, while also reducing energy consumption.

The 2024 Corporate Energy Plan includes a total of 85 energy conservation and net zero measures to be implemented over the next five years. These measures have a current estimated capital value of approximately $5.1M (2024 dollars). Once implemented, these are expected to provide energy savings equivalent to 14.8 percent of current consumption, resulting in $677,000 per year in cost avoidance and a reduction in GHG emissions of 930 tonnes per year.

2024-2029 Corporate Energy Plan Implementation Strategy

Building on the lessons learned from the implementation of past CEPs, staff propose the following strategies to implement the energy conservation and net zero measures:

- Continue focusing on implementing energy conservation measures that have a short payback period. This includes low-cost measures such as optimizing building HVAC schedules to better align with building operations. This will allow the City to realize immediate cost savings to help fund the implementation of higher cost capital measures.
- Bundle the energy conservation and net zero measures with the facility's planned major retrofit/renovation projects. This will help reduce costs and disruption to facilities.
- Implement capital-intensive net zero measures when the related equipment reaches its end of life.

To help drive this implementation strategy major facility renovations will be reviewed regularly and in advance of the annual Capital Budgeting process to determine which CEP measures can be bundled with the renovation projects.

Net Zero Strategy and Pilot Project

Since some of the recommended net zero measures and technologies are new to the City, the 2026 Capital Budget includes a pilot project as part of the Connor Building renovations to better understand their performance, costs, and maintenance requirements. The lessons learned from this pilot project, particularly the actual costs and reductions in GHG emissions, will be used to prioritize and select similar measures for implementation in other City facilities. In addition, these lessons learned will help inform a Corporate Net Zero Strategy, that will be developed over the next five years, which will establish a realistic path to net zero GHG emissions for City facilities. As part of the Net Zero Strategy, further feasibility studies will be conducted on building types that have not been studied yet.

Energy Efficiency and GHG Emissions Targets for New City Buildings

To achieve the Council approved target of net zero GHG emissions by 2050, staff are recommending the adoption of progressive energy efficiency and GHG emissions targets for new City facilities and major retrofits. The initial targets described below, will be updated in the future with more aggressive targets, as the City moves forward on its journey to net zero carbon emissions.

The targets recommended for new City facilities are consistent with the Council-approved Sustainability Metrics Program (SMP), the City's green development standards which establish targets beyond minimum provincial and municipal requirements and promote sustainable development in Richmond Hill. Aligning targets based on the City's SMP demonstrates that the City intends to lead by example in the construction of new, low carbon emitting, energy efficient municipal buildings and facilities.

The proposed targets require that all new City facilities over 500 square meters and major facility retrofits, meet or exceed the following tiers of metrics related to energy performance in the Council-approved SMP:

- **Achieve SMP "great" tier for energy efficiency metric "IB-12: Building Energy Efficiency, GHG Reduction, and Resilience"** by developing a whole-building energy model and designing and constructing buildings to the building performance metrics identified in the table below.

BUILDING TYPE	PERFORMANCE METRICS
Office Buildings	• Total Energy Use Intensity (TEUI): 135 kWh/m^2 /year • Thermal Energy Demand Intensity (TEDI): 50 kWh/m^2 /year • Greenhouse Gas Emissions Intensity (GHGI): 15 kgCO_2e/m^2 /year
All other buildings	• Minimum 25% improvement in energy efficiency over the Ontario Building Code (OBC) SB-10, Division 3 (2017) reference building.

- **Achieve SMP "excellent" tier for metric "IB-10: Solar Readiness"** by generating up to 5% of the building's total energy load from on-site renewable energy sources.

These requirements are in addition to the current requirement to achieve LEED Silver certification for new City facilities of over 500 square meters of floor area. The LEED Silver certification requirement for new City facilities is currently being reassessed.

The estimated incremental construction cost for achieving these targets is approximately 3.1%, according to a construction cost analysis conducted by the City of Toronto, published in the 'Zero Emissions Buildings Framework' report[3]. Although the

[3] The City of Toronto Zero Emissions Buildings Emissions Framework (2017).

initial capital construction cost will be higher to achieve these energy and emissions targets, part of the incremental cost will be recovered through the energy costs savings provided by the energy efficient building over its life cycle.

In support of its Zero Emissions Buildings Framework, the City of Toronto currently mandates that all new corporate facilities be built and certified as net zero emissions buildings. The City of Toronto, as well as a growing list of other municipalities including the Cities of Burlington, Guelph, Mississauga, Pickering, Whitby, and Vaughan, have taken a similar progressive approach to setting energy performance targets for new facilities and have announced municipal projects that align with a net zero emissions target.

Financial Implications:

The estimated capital cost to implement all the measures from the 2024 CEP is $5.1 million (2024 dollars). In the past, energy conservation projects have been largely funded from the Canada Community-Building Fund (CCBF), formerly known as the Gas Tax. Funding for future CEP initiatives will be requested through the annual capital budget process.

Allocation of funds for implementation of the measures contained in the CEP is necessary to ensure continued progress towards Council's target of Net Zero emissions by 2050. Staff will continue to explore opportunities to secure funds from alternate sources such as public-private partnerships and Provincial and Federal grant programs for future energy conservation projects.

Relationship to Strategic Plan 2024-2027:

The City's commitment to energy conservation and net zero aligns with the Strategic Plan Pillar 1 priority actions of "Growing a Livable Sustainable Community", which supports building new municipal infrastructure to adapt to or mitigate climate change impacts, through energy efficiency and renewable energy, and greener transportation.

Attachments:

The following attached documents may include scanned images of appendixes, maps and photographs. All attachments have been reviewed and made accessible. If you require an alternative format please call the contact person listed in this document.

- Appendix A: 2024-2029 Corporate Energy Plan.

Report Approval Details

Document Title:	SRCS.24.16-2024-2029 Corporate Energy Plan.docx
Attachments:	- Appendix A - Staff Report SRCS.24.16.pdf
Final Approval Date:	Nov 13, 2024

This report and all of its attachments were approved and signed as outlined below:

Frank Quarisa - Nov 12, 2024 - 12:59 PM

Tracey Steele - Nov 12, 2024 - 4:53 PM

Darlene Joslin - Nov 13, 2024 - 9:44 AM