TOWN OF HALTON HILLS
Working Together Working for You!

REPORT

TO:	Mayor Bonnette and Members of Council
FROM:	Stephen Hamilton - Manager of Facility Capital Projects, Michael Dean - Senior Climate Change & Energy Planner
DATE:	September 3, 2021
REPORT NO.:	ADMIN-2021-0040
SUBJECT:	Net Zero Ice Rink Feasibility Study - Recommended Capital Projects

RECOMMENDATION:

THAT Report No. ADMIN-2021-0040 dated August 30, 2021, regarding the Net Zero Ice Rink Feasibility Study – Recommended Capital Projects be received;

AND FURTHER THAT Council direct staff to proceed with the recommended Net Zero Arena Projects for 2022 as identified in this report and $1,078,000 be added to the 2022 Capital Budget for review by Budget Committee;

AND FURTHER THAT the new projects identified in this report for the years 2023-2030 in the amount of $4,127,000 be included in the 2023-2031 Capital Forecast for review by Budget Committee.

KEY POINTS:

The following are key points for consideration with respect to this report:

- Mold-Masters SportsPlex and Acton Arena account for 24% of Greenhouse Gas Emissions associated with Town operations.
- At both facilities, essential equipment has reached end of service life and was due for replacement in 2020, the Town must act to ensure that investments in these facilities are aligned with the Town's climate change mitigation targets through investing in low-carbon alternatives.
- Integration of additional heat recovery systems is an approach that most modern arenas are using and is already in operation in the new MMSP rinks built in 2013.

- Implementing the Net Zero Arenas projects is projected to require an additional capital expenditures of $1.1 million in 2022 and $4.1 million between 2023 and 2031.
- While the projects described in this report involve an additional cost, as part of an overall strategy being developed through the Net Zero Ice Rinks Feasibility Study, these investments will generate operational and maintenance costs savings over time.

BACKGROUND AND DISCUSSION:

In May 2019, Town of Halton Hills Council declared a Climate Emergency and committed the Town to a goal of achieving net-zero carbon by 2030. Meeting this target for the Town's operations requires swift action to reduce the consumption of fossil fuels including the use of natural gas at Town facilities. Given the short time frame adopted in the climate emergency, the Town cannot purchase new equipment that locks in consumption of significant fossil fuels past 2030. To meet the target set out in the 2019 declaration the Town will need to pursue low-carbon and alternative fuel options whenever possible as capital investments are made into facilities.

In service of this goal, the 2019 Corporate Energy Plan recommended that the Town develop a series of 'Low Carbon Design Briefs' (LCDB) which would provide a clear pathway to achieving net-zero carbon in Town facilities through staged implementation of retrofits and renewable energy projects. The creation of the LCDBs represents a new approach to facilities planning which allows the Town to coordinate new and planned capital upgrades to achieve energy and carbon reduction targets over several years. The Town of Halton Hills is part of a small, but growing number of municipalities taking this approach to transforming existing buildings into net-zero carbon facilities.

The first of these pathways, the Low Carbon Design Brief for Town Hall, was completed in 2020. Staff are currently developing Net Zero pathways for the Town's two arenas: Mold-Masters SportsPlex (MMSP) and Acton Arena and Community Center (AACC), as part of a *Net Zero Ice Rink Feasibility Study* project with Mayors' Megawatt Challenge (MMC) Climate Challenge Network. Preliminary conclusions from this work to date inform the recommendations in this report.

While work to develop detailed pathways to net zero for the Arenas is underway, emerging priorities associated with the need to replace old or failing equipment mean that the Town has a need to act to avoid locking in carbon emissions associated with the replacement of equipment with like-for-like systems. At MMSP and AACC, scheduled replacement or enhancement of dehumidification plants in 2020 are examples of this process. To avoid locking in emissions and move towards low-carbon outcomes for the arenas, staff are requesting additional capital budget allocation to implement heat recovery systems and procure electric dehumidification equipment.

Town of Halton Hills Corporate Emissions Profile and CEP

Town of Halton Hills operations produced 3,890 tCO^2e[1] in 2018 – the last time a complete inventory was completed. The breakdown by activity and energy type is provided in Figure 1 below.

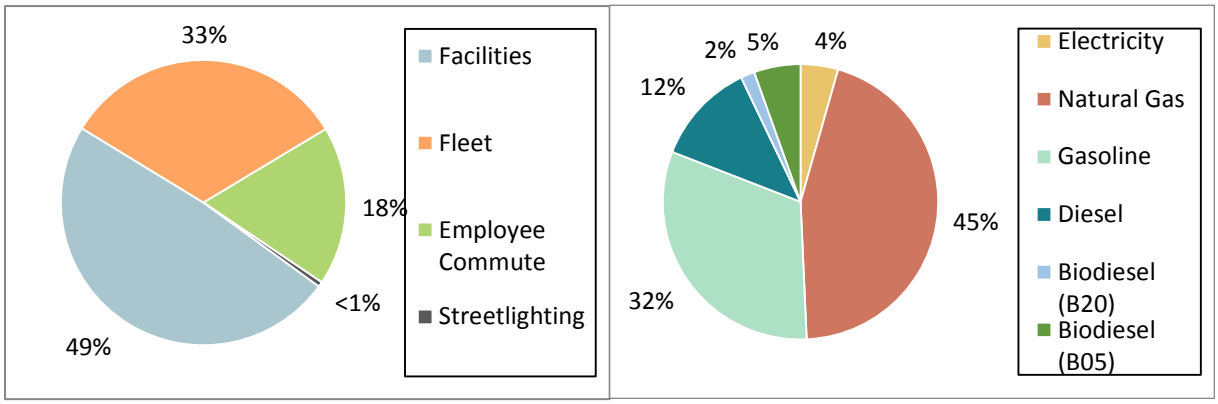


Figure 1.Town of Halton Hills, GHG Emissions by Activity and Fuel Type, 2018

The 2018 inventory demonstrates that:

- Facilities were the highest single source of emissions (49%), and natural gas made up 45% of the total GHG emissions
- Despite making up 33% of the total energy use at the Town, electricity consumption only accounts for 4% of emissions.
- MMSP and AACC represent 24% of the Town's total GHG emissions.

Switching from natural gas to electricity, particularly at facilities with high energy demand, like the arenas, is crucial to achieving the Town's climate change goals.

Mayor's Megawatt Challenge Net Zero Ice Rink Feasibility Study

In 2020, Council directed staff to implement a pathway to net-zero for the Town Hall as recommended in the Low Carbon Design Brief for Town Hall (REPORT NO. ADMIN-2020-035). The Low Carbon Design Brief for Town Hall established the viability of the LCDB approach to building retrofits.

Over the course of 2021, the Town has been participating in the MMC *Net Zero Ice Rink Feasibility Study* alongside a cohort of Ontario municipalities. The goal of this project had been to develop a feasible, replicable model for retrofitting arenas to achieve net zero. Both MMSP and AACC are subjects of this study. To date, the MMC team has worked closely with Climate Change & Asset Management (CCAM), Recreation and Parks, and other staff to develop a roadmap to net zero carbon for the arenas. Key conclusions from the work to date include:

[1] Tonnes CO^2 equivalent – a standard unit used to measure GHG emissions

- As part of a systems approach to achieving net zero, electric dehumidification and heat recovery can be successfully integrated in existing arenas.
- While these systems require additional capital investment, they reduce the total life cycle costs associated with the operation of both arenas and yield costs savings over the life of the investment.

While a complete program of measures and detailed financial analysis awaits the conclusion of the *Net Zero Ice Rink Feasibility Study* in October 2021, preliminary capital needs have been identified for inclusion in the 2023 Capital Budget and 2023-2031 Capital Forecast.

The need for these capital investments and a detailed description of the proposed alternative is provided below. The proposed projects described here are justified considering the Town's climate change goals and the service demands of the arenas, regardless of the final conclusions of the *Net Zero Ice Rink Feasibility Study*.

Priority Arena Capital Projects

Recreation and Parks have maintained a capital renewal program for all facilities within the Town asset portfolio as part of their asset management plan to maintain required levels of service. In 2016 Building Condition Assessments (BCA) were completed on all facilities. Key capital renewal for arenas recommended in the BCAs includes the replacement of mechanical and refrigeration components in the Townsley Rink at AACC and the Alcott/Fernbrook rinks at MMSP over the next one (1) to three (3) years. These projects have been identified in the capital budget with a required budget amount for replacement (table 1 below).

The development of the new Saputo/Trans Canada Energy rinks at the MMSP in 2013, extensively used heat recovery from the new refrigeration plant to provide heat to the dehumidification systems, radiant heating for arena spectator spaces and heat for the snow melting pit. This heat recovery technology wasn't employed in the development of the dehumidification and HVAC systems for the original Townsley rink and the Alcott/Fernbrook rinks.

Designing and engineering for replacement equipment and determining how systems might integrate with a new heat recovery system is critical to ensure that replacement equipment takes full advantage of the low carbon options to reduce GHG's and new required replacements that are inconsistent with a low carbon approach aren't implemented out of expediency.

For both arenas the dehumidification systems are the largest and most critical systems for managing the climate of the arenas. The effectiveness of space dehumidification has a direct correlation to the efficiency and quality of ice making in arenas which in turn is the activity that has the largest impact on the energy consumption of an arena operation. Employing a heat recovery system for the dehumidification system would be an important means of managing GHG emissions in our arenas and new dehumidification systems should be seeking to employ heat recovery instead of direct fired gas burners to provide necessary heat for the units.

The conversion of the heating, ventilation, and dehumidification systems of the Townsley rink and Alcott/Fernbrook rinks to a low carbon system that efficiently uses the waste heat recovered from the existing refrigeration operations will require the initial installation of a heat recovery system in each of the arenas simultaneously to the introduction of new dehumidification equipment in each of the facilities. The replacement or remaining heating and ventilation equipment and systems can then be phased into each of the arenas with new equipment that will also take advantage of the heat recovery system to provide energy.

The projects described above are priority projects resulting from opportunities presented by the need to replace old or inadequate equipment. Failure to complete these projects in 2022 will threaten the ability of the arenas to maintain expected levels of service.

The additional budget required to implement these changes in 2022 is $1,078,000.

Other Projects

In addition to the priority projects mentioned above, work to date on the Net Zero Arena project has identified additional opportunities to reach net zero GHG emissions at the arenas. These include a combination of entirely new projects identified because of the investigation of the MMC team in collaboration with Recreation and Parks and CCAM staff, and modifications to already anticipated capital renewal projects to align with a net zero direction.

Recommended projects included in the 2023-2031 capital forecast include:

- Building automation system and controls optimization
- Boiler replacements
- Installation of additional solar PV system
- Implement REALice ice making system
- Install Low E Ceiling
- Purchase electric ice resurfacer (AACC)
- Replacement of HVAC systems, exhaust ventilation, make-up air unit, heating generating systems, roof-top units (MMSP)

Estimates for these projects have been developed using industry standard indexes and will be incorporated into the capital forecast for 2023-2031 if council adopts this report. Further refinements will be made as part of the completion of the MMC *Net Zero Ice Rink Feasibility Study*.

Impacts of the analysis to date on forecasted capital expenditures, as well as the premium associated with the Net Zero Arenas Project ($5.2M) are listed in Table 1 below:

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Total
Existing Arena Capital Forecast	$1,473,000	$316,000	$1,408,000	$130,000	$500,000	$415,000	$861,000	$115,000	$770,000		$5,988,000
NZA Additional Capital Requirements	$1,078,000	$1,779,000	$670,000	$848,000	$300,000	$55,000	-$300,000	$305,000	-	$470,000	$5,205,000
Total	**$2,551,000**	**$2,095,000**	**$2,078,000**	**$978,000**	**$800,000**	**$470,000**	**$561,000**	**$420,000**	**$770,000**	**$470,000**	**$11,193,000**

Table 1. Forecasted capital expenditures associated with the Net Zero Arenas (NZA) Project

The existing forecast projects just under $6 million in capital investments in the arenas between 2022 and 2031. Projects associated with a net zero pathway would require an additional $5,205,000 over the same period, leading to a total capital investment in MMSP and AACC from 2022-2031 of $11,193,000.

Grant Funding Opportunities

To take advantage of grant funding opportunities available staff have submitted applications to the Canada Community Revitalization Fund (CCRF) for grants to cover part of the costs of the projects. Town staff have submitted four applications related to the work described above. The application subject and funds requested are summarized in table 2, below.

Application Subject	Funds Requested
Expansion of AACC Heat Recovery Loop	$321,930
Retrofit of AACC Dehumidification Unit	$375,000
Expansion of MMSP Heat Recovery Loop	$321,930
Retrofit of MMSP Dehumidification Unit	$750,000
Total Funds Requested	**$1,768,860**

Table 2. 2021 CCRF Funding Applications Summary

If all projects submitted for consideration under the CCRF are successful, the Town will receive $1,768,860 in grant funding to complete work towards achieving net-zero carbon in MMSP and AACC.

The Town is also working with the consultant team at MMC to align the outputs of the *Net Zero Ice Rink Feasibility Study* with the requirements of the Natural Resources Canada (NRCAN) Green and Inclusive Community Building (GICB) fund, which can provide up to $3,000,000 in funding for carbon reducing retrofit projects at recreational facilities. Regardless of the outcome of the CCRF applications staff will seek to apply to the GICB fund.

Town staff are also developing an application to the Ontario Trillium Fund's Community Building Fund. The intent of the fund is to help strengthen communities by supporting the repair, renovation or retrofitting of existing sport and recreation facilities. Projects funded through this application would contribute to achieving net zero carbon in the arenas. More details about this application are available in Report RP-2021-0022.

Staff will provide Council with an update on the status of these funding applications as they become available. If and when any external funding materializes from these grant applications program funding will be adjusted and reported to Council.

Next steps

If the revised project costs are approved as part of the 2022 budget process., staff will proceed with the procurement process in early 2022.

It is anticipated that the final LCDB/Net Zero Arena report will be completed in fall 2021. Staff will update Council with a report on the proposed long-term pathway to net zero for the arenas.

STRATEGIC PLAN ALIGNMENT:

This report aligns to the Town's Strategic plan recognizing the value to preserve, protect and enhance our natural environment for the health benefits and enjoyment it provides to present and future generations.

This report also identifies climate change and the environment as one of the Town's Strategic priorities.

RELATIONSHIP TO CLIMATE CHANGE:

This report impacts and/or helps address climate change and the Town's Net Zero target through corporate energy savings.

PUBLIC ENGAGEMENT:

Public Engagement will be required; consultation with Communications staff to follow. Staff will develop a communication plan as work is initiated to make the public aware of ongoing projects and their role in supporting the Town's climate change goals.

INTERNAL CONSULTATION:

Staff consulted with members of the Corporate Energy Management Team, as well as staff from Finance, Recreation and Parks and CCAM at various times throughout the development of this report.

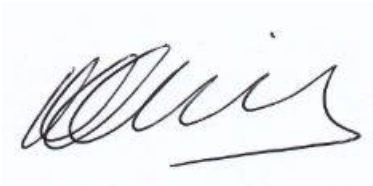
FINANCIAL IMPLICATIONS:

This report has an immediate financial impact and requires a funding source.

As discussed above, the estimated capital expenditures associated with the identified projects for standard renewal of the arena facilities is $5,988,000. An additional premium of $5,205,000 between 2022 and 2031 has been estimated, to facilitate the integration of measures to meet the Town's net-zero emissions goals. This increases the original ten-year capital requirements by $5,205,000 ($1,078,000 in 2022) to a total of $11,193,000. These additional costs are being recommended for inclusion in the preparation of the 2022 Capital Budget and Forecast for consideration by Budget Committee.

Staff will continue to explore and investigate available external funding options to support these additional costs. If any external funding materializes, the funding for these projects would be adjusted and reported to council when confirmed.

Reviewed and approved by,



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