

## Staff Report 2021-0159

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Meeting Date: May 18, 2021

Subject: Energy Revolving Fund 2021 Projects

Submitted By: Craig Stephens, Specialist, Energy and Environment, Corporate Strategy and Innovation

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### RECOMMENDATION

That a new 2021 capital project be established in the amount of \$119,100, funded from the Corporate Energy reserve, for projects outlined in Table 1 of Staff Report 2021-0159.

### REPORT HIGHLIGHTS

- In 2015, Council approved the establishment of a Corporate Energy Revolving Fund (CER Fund) to support the Corporate Energy Team implement energy conservation projects that align with the Town's Corporate Greenhouse Gas Reduction Framework.
- The CER Fund is self-sustaining, where funds used to pay for energy retrofit projects and initiatives at Town facilities are repaid with the energy savings realized on applicable utility operating budgets.
- The Corporate Energy Team is recommending the release of \$119,100 from the CER Fund to support a LED retrofit project at the Caledon East Community Complex and an ice rink resurfacing water treatment retrofit at the Albion Bolton Community Centre.

### DISCUSSION

Council approved the Town's Corporate Greenhouse Gas (GHG) Reduction Framework (Staff Report 2019-73) to align with the *Electricity Act* requirements of having a five-year energy conservation and demand management plan. The objective of the Framework is to reduce the Town's corporate GHG emissions by 24% or 853 tCO<sub>2</sub>e below 2017 levels by 2024. To achieve the Town's energy conservation targets, staff established the CER Fund (Staff Report PW 2015-047) in 2015. The Model of the CER Fund is outlined below:

- **CER Fund Base:** The CER Fund base is supported by three MicroFIT solar projects that generate approximately \$25,000 annually, energy incentives received by the Town, and twenty-five percent of energy retrofit savings from previous CER fund projects. The current unaudited balance of the CER Fund is \$234,461.42.
- **Business Case:** The Corporate Energy Team submits energy conservation project ideas to the Energy and Environment Division that save energy and have a maximum ten-year simple payback. Staff consolidates the project ideas and request that Council endorse funding for the proposed projects.

- **Energy Retrofit:** After Council approval, funds are released from the CER Fund, and approved energy retrofit projects are implemented by the end of the calendar year.
- **Energy Savings:** The energy retrofit projects result in energy savings which are realized on the facility's utility operation budget.
- **Savings Paid Through Utility Budget:** Annual savings, based on the simple payback, are diverted from the applicable utility budget line (natural gas, electricity, or water) back to the CER Fund until the initial cost is recovered back to the CER Fund.

### 2021 Proposed CER Fund Projects

Staff recommend that the following retrofit projects described in Table 1, be funded by the CER Fund. It is estimated that these projects will save 225,050 equivalent kilowatt-hours (ekWh) of energy, \$23,184 annual in utility costs, and result in 17.49 tonnes of avoided carbon dioxide equivalent (CO<sub>2</sub>e).

**Table 1: 2021 Recommended Energy Revolving Fund Projects and CER Fund Repayment**

Site & Project	Recommended 2021 Fund Disbursement with non-recoverable HST	Energy Savings (ekWh)	GHG Emissions Savings (tCO <sub>2</sub> e)	Annual Energy Cost Savings & CER Fund Repayments	Simple Payback (years)	Estimated Incentive
CECC Arena LED Retrofit	\$82,328	104,031	3.12	\$14,564	5.65	\$9,540
ABCC Resurfacing Water Retrofit	\$36,772	121,019*	14.37	\$8,620	4.27	\$1,500
<b>Total:</b>	<b>\$119,100</b>	<b>225,050</b>	<b>17.49</b>	<b>\$23,184</b>	<b>4.67</b>	<b>\$11,040</b>

\*Savings converted into equivalent kWh is as follows: 49,568 kWh + (6,723 m<sup>3</sup> x 10.6278) = 121,018 ekWh

#### *(1) Caledon East Community Complex: Arena LED Retrofit*

This project proposes to retrofit 208 fluorescent light fixtures (or 1010 lamps) with LED fixtures above the twin ice pads, stands, and arena walkways. Retrofitting to LEDs will improve lighting levels, improve occupancy comfort, reduce energy consumption, and result in operating and maintenance cost savings (LED lighting lasts longer than fluorescent lighting).

This project will result in an estimated annual electricity savings of 104,031 kWh or \$14,564 in operating costs, as outlined in Table 1.

*(2) Albion Bolton Community Centre: Ice Rink Resurfacing Water Retrofit*

This project involves the installation of a water-treatment device that will save energy by allowing staff to resurface the ice rink using colder water temperatures. Traditionally arenas use heated water to remove water impurities, such as minerals and gases, before resurfacing the ice rink to achieve a high-quality ice surface. This process requires energy to heat the water to high temperatures to flood the ice and for the refrigeration plant to remove heat from the ice surface due to the application of warm water. The proposed retrofit is a water-treatment wall system that will be integrated into the existing Zamboni filling station piping to remove the water impurities before it enters the ice resurfacing machine, eliminating the need to heat the arena resurfacing water.

This technology was piloted at the Mayfield Recreation Complex, as one of the 2019 CER Fund projects. Staff worked with a third-party engineering firm to verify the savings associated with this project, which resulted in an annual reduction of 84,188 kWh of electricity, 2,800 m<sup>3</sup> of natural gas, and \$10,775 operating cost savings. Based on these positive results, staff recommend the use of this technology at Albion Bolton Community Centre ice pad.

This retrofit project is estimated to save 6,723 cubic metres (m<sup>3</sup>) of natural gas, 49,568 kWh and an annual operating cost savings of \$8,619 as described in Table 1. The savings estimates differ from the findings found at the Mayfield Arena due to different base-case inputs, such as hot water flood temperature, brine temperature, operational hours and floods per day, and chiller plant efficiency.

## **FINANCIAL IMPLICATIONS**

Staff recommend that a new 2021 capital project, in the amount of \$119,100 be established for the LED retrofit project at the Caledon East Community Complex and the ice rink resurfacing water treatment retrofit at the Albion Bolton Community Complex funded by the Corporate Energy Reserve account # 08-00-900-35012-000-25000. The current uncommitted balance in the Corporate Energy Reserve is \$234,461.42.

Subject to Council approval of this report, it is anticipated that all CER Fund projects will be completed in 2021. The projected annual energy savings will be reduced from the utility budget line for each respective facility and will be shown as a contribution to the Corporate Energy Reserve in 2021 as outlined in Table 2 below.

**Table 2: Energy Reserve Repayment Terms**

<b>Site &amp; Project</b>	<b>GL Accounts of Projected Utility Savings</b>	<b>Recommended 2021 Fund Disbursement</b>	<b>Annual Energy Cost Savings &amp; CER Fund Repayments</b>	<b>Fund Repayment Terms in years (Simple Payback)</b>
CECC Arena LED Retrofit	01-08-465-73020-430-62216	\$82,328	\$14,564	5.65
Albion Bolton Community Centre (Electricity)	01-08-465-73020-405-62216	\$36,772	\$6,939	4.27
Albion Bolton Community Centre (Gas)	01-08-465-73020-405-62215	Same project as above	\$1,681	Same project as above
<b>Total:</b>	<b>N/A</b>	<b>\$119,100</b>	<b>\$23,185</b>	<b>4.67</b>

After the capital cost of the projects are repaid in full to the reserve, 75% of the projected utility savings will be used to reduce the Town's future operating budget as budget efficiency. The remaining 25% will continue as a contribution to the Corporate Energy Reserve to grow the fund to ensure sustainability.

Any energy incentives received by the Town for energy retrofits will be allocated to the Corporate Energy Reserve. The estimated energy incentives as outlined in Table 1 are \$11,040.

## **COUNCIL WORK PLAN**

**Connected Community** – Develop a five-year Corporate Greenhouse Gas Reduction Framework including energy consumption in facilities, corporate fleet and fuel use, water conservation strategies in facilities and parks and waste diversion strategies.

## **ATTACHMENTS**

None.