



**CORPORATE FACILITIES
MEMORANDUM**

Page: 1
File: E11
Pending #:

TO: MAYOR J. LEHMAN AND MEMBERS OF COUNCIL

FROM: A. MCMULLIN, MANAGER OF ENERGY MANAGEMENT, EXT. 5097

NOTED: R. PEWS, DIRECTOR OF CORPORATE FACILITIES

D. MCALPINE, GENERAL MANAGER OF COMMUNITY AND CORPORATE SERVICES

M. PROWSE, CHIEF ADMINISTRATIVE OFFICER

RE: ENERGY MANAGEMENT 2019 YEAR-END REPORTING, ALL WARDS

DATE: MAY 11, 2020

The purpose of this Memorandum is to provide members of Council with an update on corporate energy performance and energy management initiatives during the 2019 fiscal year.

Energy Management Mandate

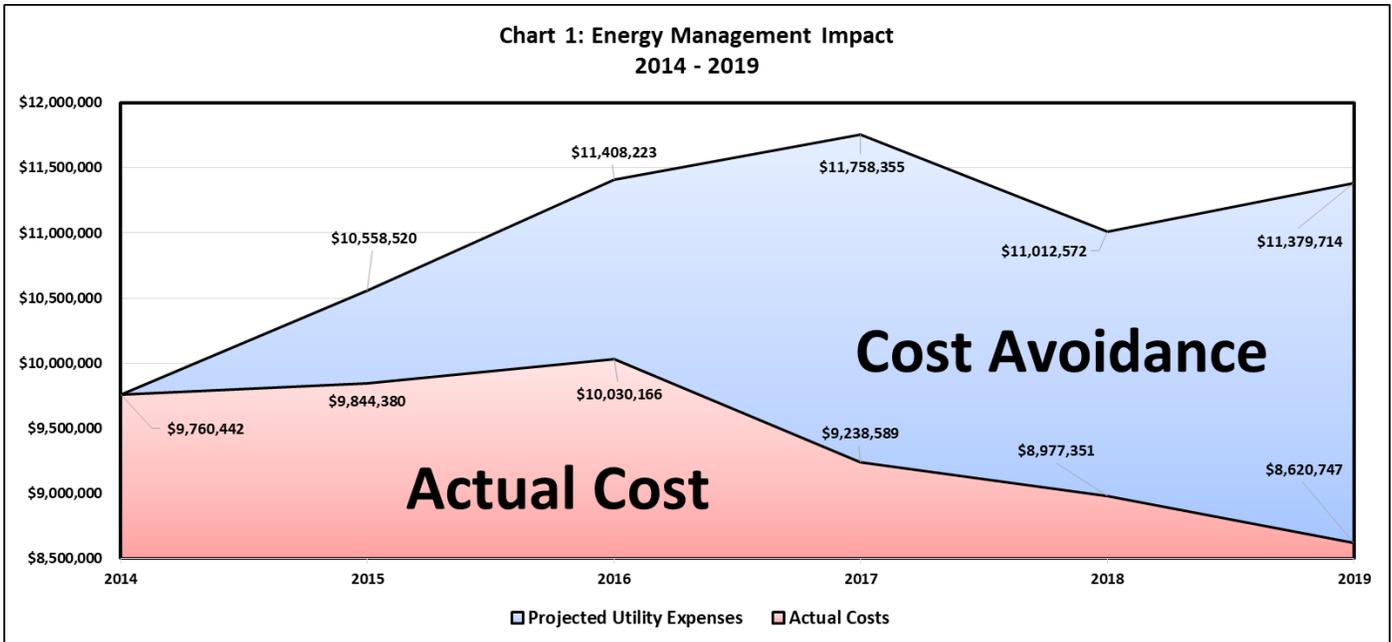
The Energy Management Branch mandate is focused on reducing utility consumption and associated costs for all City owned and operated infrastructure. Utility costs are comprised of electricity, natural gas, propane and water that are used to service our facilities, water and wastewater infrastructure, parks, street lighting and traffic signals.

Cost Savings & Impacts

The Energy Management Branch undertakes a variety of activities that contribute to efficiency improvements, cost avoidance and savings for the corporation. The following highlight the economic value and impact of Energy Management activities for the City in 2019:

- 1) An annual utility cost reduction of \$356,604 (4%) compared to 2018 expenses
- 2) A favourable utility budget variance of \$879,513 (9.3%)
- 3) An annual utility cost avoidance of \$587,849
- 4) Obtained \$132,208 in incentive revenue
- 5) Invested \$175,293 in capital funding which is estimated to generate an annual cost avoidance of \$120,291
- 6) Secured provincial grant funding of up to \$90,000 to support the development of community energy and greenhouse gas emission reduction plan
- 7) Achieved over \$9.4 million in cost avoidance since the inception of the Energy Management Branch in 2013

Chart 1 and Table 1 illustrate these cost savings and impacts.



The savings were realized through significant reductions in electricity and water consumption at a number of large facilities within the City's portfolio, these are highlighted in further detail in Table 1.

Table 1: 2014 - 2019 Utilities Cost Summary

Year	Actual Cost	Difference from previous year (%)	Difference from previous year (\$)
2014	\$ 9,760,442		
2015	\$ 9,844,380	0.9%	\$ 83,938
2016	\$ 10,030,166	1.9%	\$ 185,786
2017	\$ 9,238,589	-7.9%	\$ (791,577)
2018	\$ 8,977,351	-2.8%	\$ (261,238)
2019	\$ 8,620,747	-4.0%	\$ (356,604)

2019 Highlights

The following items highlight the successes achieved within the Energy Management program in 2019.

Corporate Energy Management Plan Renewal

Provincial regulation requires municipalities to renew / update their energy conservation and demand management plans every five years. These plans establish targets and a framework to achieve energy efficiency within City operations.

The Energy Management Branch developed a new plan, in house, that was adopted by Council in the late fall of 2019. It is estimated that by utilizing internal resources to develop this plan the Corporation saved up to \$50,000 in consulting fees typically charged for this type of work. The plan, developed based on a best practice guidance methodology provided by Natural Resources Canada, established targets utilizing benchmarking performance analytics and provides a pathway for the City to become a top performing entity from an Energy Management perspective.

High Performing Facilities & Operations Highlights

There are a number of facilities and operations within the City that performed exceptionally well in 2019 from an efficiency perspective. These include:



East Bayfield Community Centre

In the fall of 2019, the City received an award from the Mayor's Megawatt Challenge (MMC) Program. The awarded is granted to facilities that reduce energy consumption by 10% compared to the previous year. The East Bayfield Community Centre exceeded this threshold by achieving an energy reduction of 14.7%. This energy performance resulted in a year over year savings of nearly \$30,000.

Capital investment in new energy efficient equipment, particular lighting improvements, boilers and heat exchangers as well as the continued optimization of the building automation system control by Recreational Services operational staff have generated these outstanding results.

MacLaren Art Centre

In late 2018, the Energy Management Branch completed a recommissioning study of the MacLaren Art Centre that identified a number of low and no cost energy efficiency opportunities for implementation. Corporate Facilities operations staff have enthusiastically implemented the majority of the recommendations and the savings are larger than anticipated. Electricity usage was down 31% year over year, representing a cost avoidance exceeding \$30,000 that required only staff time to implement.

City Hall

Optimization of the City Hall heating systems, equipment scheduling and the parking garage ramp heater control system contributed to an overall year-over-year energy reduction of 9%, led by an 18% savings in electricity consumption that represents a cost avoidance of \$56,000.

Surface Water Treatment Facility

Operations Staff within the Corporate Facilities department received an Edison Innovation Award for their work in optimizing the cooling system at the Surface Water Treatment Facility. Operations Staff isolated the chiller system in the winter and provided an alternative source of cooling that contributed to an overall electricity consumption reduction of 13% and resulting cost avoidance of nearly \$90,000.

Ground Water & Parks Operations

In 2018 a large number of potable water services that have been historically utilized by Parks Operations and the Ground Water Operations came online, meaning that the consumption and costs of these services were now being metered and accounted for. For Parks Operations, these services include water meter pits that are used for irrigation or for ice making purposes in the winter (for parks that have outdoor rinks). For the Ground Water Operations, these services are primarily found in the ground water well infrastructure.

These previously unmetered services utilize significant volumes of water and correspondingly add to the cost of operations. Working collaboratively with these Branches, usage of potable water usage was reduced dramatically in 2019, by over 31,000m³. This reduction in consumption has a corresponding annual cost avoidance of \$173,000.

Capital Program Investment Summary and Impact

In 2019, the Energy Management branch invested \$172,293 in capital funding to implement conservation initiatives achieving a minimum rate of return of 10% over the lifetime of the asset. These activities focused on lighting retrofits, heating/refrigeration system optimization and renewal.

Table 2 provides a summary of the projects completed and the associated energy savings, cost avoidance and estimated incentives.



CORPORATE FACILITIES MEMORANDUM

Page: 4
File: E11
Pending #:

Table 2: 2019 Energy Management Capital Program Investment Summary

Project	Facility	Energy Management Investment	Energy Savings (ekWh)	Cost Avoidance (\$)	Incentive (\$)	Simple Payback (Years)
T5 LED Lighting Retrofit	Allandale Recreation Centre, East Bayfield Community Centre, Holly Community Centre, Eastview Arena	\$ 63,913	499,962	\$ 76,994	\$ 29,040	0.5
Lighting Retrofit	Sadlon Centre	\$ 29,170	43,174	\$ 6,649	\$ 2,158	4.1
Domestic Hot Water Boiler Replacement	East Bayfield Community Centre	\$ 29,307	279,843	\$ 7,373	\$ 7,293	3.0
Lighting Retrofit	Transit Garage	\$ 32,154	138,259	\$ 21,292	\$ 10,160	1.0
Ice Chiller Heat Exchanger Expansion	Holly Community Centre	\$ 6,166	25,200	\$ 3,881		1.6
In-Floor Heating Optimization	Fire Headquarters	\$ 8,243	49,660	\$ 2,834		2.9
Optimization Activities	Various	\$ 6,341	8,235	\$ 1,268		5.0
Total:		\$ 175,293	1,044,333	\$ 120,291	\$ 48,651	1.1

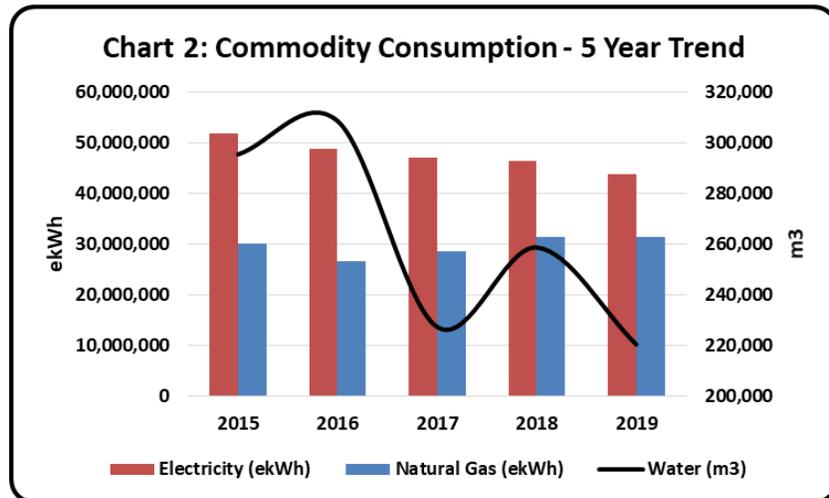
This investment is estimated to have a payback of just over one year, generated nearly \$50,000 of incentive revenue and produce a cost avoidance representing a 1% reduction in annual utility costs moving forward.

Energy and Water Consumption Summary - 2019

In 2019 City operations realized an overall reduction in energy usage of 3.4% from the previous year. This decrease was driven by a 5.8% reduction in electricity usage, flat natural gas consumption and a modest increase in propane that is used for heating purposes.

Water consumption decreased nearly 15%, by a total of 38,203m³.

Chart 2 summarizes the five year consumption trend for these commodities. These trends show significant decreases in hydro and water uses compared to 2015, at 16% and 25% respectively. Natural gas usage has fluctuated up and down over this period which is influenced and partly attributed to variance in winter weather from year-to-year.



Moving Forward

Energy Management staff are focusing on the following activities in 2020:

- Initiation of community energy and greenhouse gas emission reduction plan
- Developing a corporate carbon neutrality strategy for Council's consideration in the 2021 business plan
- Implementation of energy conservation capital projects
- 2021 utility budgeting and capital plan development
- Establishing strategic partnerships with key partners (i.e. Alectra / Enbridge) to facilitate future sustainability initiatives
- Developing Green Building Standard for corporation operations

Should you have any questions about the activities of the branch or the contents of this memo please do not hesitate to contact me at extension 5097.