

<p>7. 2020 CORPORATE ENERGY REPORT RAPPORT MUNICIPAL SUR L'ÉNERGIE DE 2020</p>
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COMMITTEE RECOMMENDATION

That Council receive this report for information.

RECOMMANDATIONS DU COMITÉ

Que le Conseil prenne connaissance du présent rapport.

DOCUMENTATION/DOCUMENTATION

1. Chief Procurement Officer's report, Supply Services, Innovative Client Services, dated May 20, 2021 (ACS2021-ICS-PRO-0001)

Rapport de la Directrice générale, Services sociaux et communautaires, daté le 20 mai 2021, (ACS2021-ICS-PRO-0001)

**Report to
Rapport au:**

**Finance and Economic Development Committee
Comité des finances et du développement économique
1 June 2021 / 1er juin 2021**

**and Council
et au Conseil
9 June 2021 / 9 juin 2021**

**Submitted on May 20, 2021
Soumis le 20 mai 2021**

**Submitted by
Soumis par:**

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Ward: CITY WIDE / À L'ÉCHELLE DE LA VILLE File Number: ACS2021-ICS-PRO-0001

SUBJECT: 2020 CORPORATE ENERGY REPORT

OBJET: RAPPORT MUNICIPAL SUR L'ÉNERGIE DE 2020

REPORT RECOMMENDATION

That the Finance and Economic Development Committee and Council receive this report for information.

RECOMMANDATION DU RAPPORT

Que le Comité des finances et du développement économique et le Conseil prennent connaissance du présent rapport.

EXECUTIVE SUMMARY

Assumptions and Analysis

The purpose of this report is to update Council on the work of the Corporate Energy Management Office (Energy Management Office). The work of this office was first identified in the Council approved [Energy Evolution: Phase 1](#). The Energy Management Office was created considering best practices from other Canadian municipalities, and in response to the recommendations of the 2019 Audit of Recreation, Cultural and Facility Services Department - Building Engineering and Energy Management Unit ([RCFS-BEEM](#)) report.

The work supports the goals of the 2019-2022 Term of Council Strategic Priorities. This report highlights the innovative use of data to enable more financially efficient and responsive operations in alignment with Council's strategic priority of Service Excellence through Innovation. Importantly, the work of the Energy Management Office is also aligned to Council's strategic priority of Environmental Stewardship and supports positioning the City as a leader in energy management, conserving resources, and reducing its greenhouse gas emissions.

In 2020, the City spent \$42 million on electricity usage across a portfolio of over 1,300 Hydro One and Hydro Ottawa accounts. The Energy Management Office was established in Q3 2019 to be responsible for compiling, analyzing and disseminating energy data and information between different operational areas and Corporate Finance (including utility spend, consumption, rebate analysis, and budget analysis).

Financial Implications

The Energy Management Office was able to realize the following savings and cost avoidances in 2020, through the proactive monitoring of electricity legislation changes, optimization of account rate classes, analytical review of complex billing structures and energy project savings validation:

- ~\$2.4 million in cost avoidance due to rate class optimizations
- ~\$1 million in recurring annual savings through project validation
- ~\$860 thousand in recurring cost avoidances by capturing eligible electricity rebates
- ~\$255 thousand in one-time savings through project validation
- ~\$140 thousand in cost avoidances resulting from strategic billing optimization

Over and above the activities of the Energy Management Office, the COVID-19 pandemic also had a significant impact on electricity consumption and costs in 2020. As a result of reduced electricity consumption at a number of City facilities, the City attained a one-time, year over year savings of \$3.1 million. In addition, the introduction of COVID-19 related provincial legislation changes will contribute an additional cost avoidance of \$4.2 million to be realized in 2021.

This report includes information on the implementation of a Corporate Energy Policy, prioritization and validation of energy project savings, and an initiative to use data to help staff make informed decisions to reduce overall electricity spend.

RÉSUMÉ

Hypothèses et analyse

Le présent rapport a pour but d'informer le Conseil des travaux du Bureau de la gestion municipale de l'énergie (Bureau de la gestion de l'énergie). Ceux-ci ont été présentés pour la première fois dans le rapport [Évolution énergétique, phase 1](#) approuvé par le Conseil. [Le Bureau de la gestion de l'énergie a été créé à la lumière des](#) pratiques exemplaires d'autres municipalités canadiennes et en réponse aux recommandations du rapport de 2019 *Vérification de l'unité Mécanique des bâtiments et Gestion de*

l'énergie de la Direction générale des loisirs, de la culture et des installations ([MBGE-DGLCI](#)).

Les travaux appuient les objectifs des priorités stratégiques du mandat du Conseil pour 2019-2022. Le présent rapport revient sur l'utilisation novatrice qui est faite des données pour favoriser la viabilité financière et l'adéquation des opérations, en conformité avec la priorité stratégique du Conseil en matière d'excellence du service par l'innovation. Notons que les travaux du Bureau de la gestion de l'énergie concordent également avec la priorité stratégique du Conseil liée à l'intendance environnementale et contribuent à faire d'Ottawa un chef de file en matière de gestion de l'énergie, de conservation des ressources et de réduction des émissions de gaz à effet de serre.

En 2020, la Ville d'Ottawa a dépensé 42 millions de dollars pour sa consommation d'électricité sur un portefeuille de plus de 1 300 comptes d'Hydro One et d'Hydro Ottawa. Le Bureau de la gestion de l'énergie a été créé au troisième trimestre de 2019 pour compiler et analyser les données et les renseignements sur l'énergie et les diffuser entre les différents secteurs d'activités et les Services des finances municipales (y compris les dépenses des services publics, la consommation, l'analyse des remises et l'analyse budgétaire).

Répercussions financières

En 2020, grâce à un suivi proactif des changements législatifs liés à l'électricité, à l'optimisation des classes tarifaires, à l'examen analytique des barèmes de facturation complexes et à l'approbation des projets d'économie d'énergie, le Bureau de la gestion de l'énergie a réalisé les économies suivantes :

- Économies d'environ 2,4 millions de dollars grâce à l'optimisation des classes tarifaires;
- Économies annuelles récurrentes d'environ 1 million de dollars grâce à l'approbation des projets;
- Dépenses de quelque 860 000 dollars évitées de manière récurrente grâce aux remises d'électricité admissibles;
- Économie ponctuelle d'environ 255 000 dollars grâce à une approbation de projet;

- Dépense de quelque 140 000 dollars évitée grâce à l'optimisation stratégique de la facturation.

Outre les activités du Bureau de la gestion de l'énergie, la pandémie a eu des répercussions importantes sur la consommation et les coûts d'électricité en 2020. La diminution de la consommation d'électricité dans plusieurs de ses installations a permis à la Ville de réaliser des économies ponctuelles sur un an de 3,1 millions de dollars. De plus, les modifications législatives provinciales adoptées dans la foulée de la COVID-19 permettront de réaliser des économies supplémentaires de 4,2 millions de dollars en 2021.

Le rapport décrit la mise en place d'une politique municipale sur l'énergie, la priorisation et l'approbation des projets d'économie d'énergie, et une initiative d'utilisation des données qui aidera le personnel à prendre des décisions éclairées afin de réduire les dépenses globales d'électricité.

BACKGROUND

The creation of the Energy Management Office was first identified as a short-term action to be implemented in 2019 with the purpose of finding energy savings through conservation and demand management as part of the Council approved [Energy Evolution: Phase 1](#) report tabled in December 2017.

The Energy Management Office was established in 2019 within Supply Services, in response to an assessment of current energy management practices at the City, best practices from other Canadian municipalities, and the recommendations provided in the Audit of [RCFS-BEEM](#) received by the Audit Committee and City Council in April of 2019.

The Energy Management Office is responsible for compiling, analyzing and disseminating energy data and information between different operational areas and Corporate Finance. The Energy Management Office, in collaboration with Service Areas, is responsible for developing a consistent framework for the screening and prioritization of energy projects, project implementation, monitoring, and reporting on benefits

Service Areas continue to be responsible for their own operations and decision making as the subject matter experts for their fields, and they continue to be responsible for

identifying and managing individual projects, implementing operations specific initiatives, day-to-day energy monitoring, and developing energy project ideas.

The current focus of the Energy Management Office is to implement strategic oversight of the spend, reporting, and optimization of the City's electricity accounts.

Key to the Energy Management Office's operating model is the promotion of data analytics to inform electricity stakeholders' decision-making. By developing innovative strategies and in-house tools to optimize data analytics, the Energy Management Office is able to provide Departmental Manager's improved knowledge and insight into the ways in which their operations and facilities use electricity. This information will be integral to achieving Council's climate change targets and ensure climate considerations are incorporated in operational decisions, energy project selection and prioritization.

The Energy Management Office will also support Planning, Infrastructure and Economic Development's Climate Change & Resiliency Unit in the development of an Electricity Resource Strategy. This strategy will leverage data to further understand the benefits and impacts for Energy Evolution goals, such as solar generation projects.

In order to integrate and report energy management activities across the corporation, this report was developed in consultation with key energy stakeholders including the Planning, Infrastructure and Economic Development Department, Recreation, Cultural and Facility Services Department, Transportation Services Department and the Finance Services Department.

DISCUSSION

The purpose of this report is to update Council on the work of the Energy Management Office which support the outcomes of two of the Term of Council Priorities in the [2019-2022 City Strategic Plan](#). The strategic priority of Service Excellence Through Innovation is supported by the innovative use of data that enables more financially efficient and responsive operations. The work also positions the City as a leader in energy management, conservation of resources, and greenhouse gas emissions reductions in alignment with the outcomes of Council's Environmental Stewardship priority.

The City of Ottawa is committed to energy management as a key component of its operations and is striving to deliver improvements in an environmentally responsible way.

The City's Electricity Portfolio

The City's electricity portfolio currently consists of over 1,300 Hydro One and Hydro Ottawa accounts. As identified in the audit of RCFS-BEEM, prior to the establishment of the Energy Management Office, no one corporate entity had visibility into the City's complete electricity portfolio, or a complete view of the size or priority of the addressable opportunities for energy efficiency across the City.

Given the size of the City's annual electricity spend, amounting to \$42 million in 2020, changes in operations, legislation, or consumption can have significant impacts on the City's costs. As a result, the Energy Management Office performs a variety of tasks focused on responsible financial stewardship. This includes proactively monitoring the impacts of changes in electricity related legislation; validating the results of energy efficiency projects to inform future project selection; validating bills; and continually assessing the City's over 900 facilities in order to optimize rate classifications and available rebates.

In 2020, these activities resulted in one-time savings of approximately \$255 thousand and estimated recurring annual savings of \$1 million, in addition to a further \$3.5 million in cost avoidances. Cost avoidances describe costs that would have been incurred if a specific action had not been taken.

Over and above the activities of the Energy Management Office, the COVID-19 pandemic also had a significant impact on electricity consumption and costs in 2020. As a result of reduced electricity consumption at a number of City facilities, the City attained a one-time year over year savings of \$3.1 million. In addition, as further described below, the introduction of COVID-19 related legislation changes will contribute an additional cost avoidance of \$4.2 million to be realized in 2021.

Legislative Changes

The Energy Management Office's financial analyses are complex, as electricity is regulated by an ever-evolving legislative framework and bills are calculated based on

varying formulas depending on the account's rate classification. These calculations include:

- demand (the rate at which electricity is consumed)
- consumption (usage over a period of time)
- rebates
- delivery charges (regulatory component established to cover the cost of delivering electricity to the end user)

In addition, the electricity charges themselves are made up of Hourly Prices and a monthly fluctuating "Global Adjustment", which is a mechanism to cover the Province's electricity supply costs.

In 2020, this legislative framework was made more complex with the onset of the COVID-19 pandemic and associated emergency orders.

The most significant legislative impact related to the introduction of [Ontario Regulation 191/20](#) in April 2020, which included a three-month cost deferral for Class A and B accounts to maintain price consistency and to support economic recovery during COVID-19 shutdowns. The deferred costs had intended to be recovered over a 12-month period beginning in January 2021; however, the passing of the 2020 Ontario Budget, shifted costs of the recovery to the Provincial government.

The eligibility criteria of the Ontario Electricity Rebate program was changed in 2020 under [Ontario Regulation 363/16](#). The Energy Management Office worked with the Building Engineering and Energy Management Unit in the Recreation, Cultural and Facilities Services Department to review historical consumption trends to identify facilities that would qualify for the new rebate. As a result of this effort, 74 accounts were registered in the program for an additional cost avoidance of \$860 thousand.

Rate Class Optimization

In order to ensure the most optimal financial decisions were being made for the City, the Energy Management Office undertook an analysis to validate that accounts were registered in the most optimal rate classification. As described below, by optimizing rate classifications, the City achieved a cost avoidance of \$2.4 million in 2020 when

compared to the costs the City would have incurred had the accounts been registered in different rate classifications.

The City's electricity accounts are divided into approximately 20 different pricing structures; however, they can be primarily separated into the following three classifications:

- Registered Price Plan accounts. These accounts generally have low consumption and are billed solely on electricity use. These accounts include fire stations and small community centers and make up the majority of city accounts, 86 per cent, but less than 10 per cent of the City's total electricity costs.
- Mid-to-large Class "B" accounts. These accounts are billed based on a combination of consumption (including the Global Adjustment) and demand. Class B accounts include facilities like Ben Franklin Place and the Greenboro Public Library and make up 13 per cent of the City's accounts and approximately 60 per cent of total electricity costs.
- Large Class "A" accounts. These are the City's largest accounts and include facilities like Robert O. Pickard Environmental Centre and City Hall. These facilities make up only one per cent of City accounts but approximately 32 per cent of electricity costs.

Class A accounts can benefit from a billing model through the Provincial Industrial Conservation Initiative, whereby the Global Adjustment which makes up 60 to 80 per cent of the facility's electricity costs, is calculated based on the facility's electricity consumption during specific grid-use peaks.

Notwithstanding the impact of operational changes and facility closures resulting from the COVID-19 pandemic, the Energy Management Office concluded that all facilities eligible to be registered in Class "A" would continue to benefit from enrolment in the program. Moreover, the City would benefit from the enrollment of an additional five new accounts related to the first stage of O-Train Line 1. In total, fourteen accounts were enrolled in the Class A program in 2020.

Strategic Billing Optimization

Given the approximately 20 different rate class structures across the City's 1,300 accounts, as well as complex rebate and billing programs, an opportunity existed to develop improved processes to consistently review costs and consumption at a corporate level.

The Energy Management Office has developed innovative tools and processes that permit the electricity bills for over a thousand City buildings, parks, streetlights, and more, to be automatically vetted for correctness and completeness every month prior to payment, resulting in over \$140 thousand in cost avoidances in 2020.

Invoice analytics have defined a key opportunity for the Energy Management Office to apply data-driven approaches to the payment of one of the most significant facility-level costs for City properties. For example, the Energy Management Office developed an Invoice Validation Tool that automatically flags billing anomalies by using historical data to forecast the estimated cost of a monthly bill for each account. Deviations from the forecast are flagged for investigation at the account level as potential errors.

Corporate Energy Policy

The audit of RCFS-BEEM identified an opportunity to improve the manner in which energy efficiency opportunities across City facilities are identified and prioritized. In response, and in collaboration with key departmental stakeholders, the Energy Management Office developed a Corporate Energy Policy to provide a consistent approach to the prioritization of energy projects, project implementation, monitoring and reporting on benefits.

Following the creation of the Policy, a cross-departmental project selection committee consisting of representatives from Facility Operations Services, Infrastructure Services, Energy Evolution and the Energy Management Office was established to help align potential projects with greater corporate objectives. This has included, among other things, the incorporation of greenhouse gas reduction opportunities to better align project selection with the Council-approved [Climate Change Master Plan](#) and respond to the current and future effects of climate change. Common requirements for the approval and initiation of energy efficiency projects has been integrated into the

process. This systematic process will help to standardize the project assessment, selection process and to better articulate the true cost and benefits of each opportunity.

In keeping with the Policy, the Energy Management Office has worked with energy efficiency stakeholders across the City to develop and report on the progress of energy efficiency initiatives and to give departmental staff access to comprehensive and timely performance information. This information will be included in the [Conservation and Demand Management Plans](#) the City develops every four years as required by the provincial Electricity Act, 1998. The next Energy Conservation and Demand Management Plan is scheduled to be completed in 2023.

Energy Project Validation and Prioritization

Every year, the City undertakes a large number of projects designed to reduce energy consumption at facilities. Developing a data-driven process to track the projected savings of projects against the actual consumption was identified as an opportunity to ensure that project investments were receiving the most valuable returns and that these findings were used to inform the broader project selection process.

In order to validate that a project is achieving its objectives, the Energy Management Office uses data regressions to analyze a facility's electricity consumption before and after a project. Regression analytics are powerful data models that allow for the examination of the relationship between a facility's consumption, a project, and other variables such as monthly consumption variations and weather.

Weather is a particularly important variable to control for as electricity is often used for cooling. Controlling for weather allows for the identification of consumption spikes that may be independent of facility performance.

In 2020, the Energy Management Office validated the results of 32 energy efficiency projects completed in 2019, in addition to a number of on-going projects across the Corporation. Overall findings suggest that electric energy efficiency projects are in large part achieving the electricity and cost reduction benefits projected.

With regards to the LED streetlight conversion project specifically, the Energy Management Office worked with Transportation Services to validate savings being realized through the project. As a result of this exercise, it was determined that the

project was performing better than what was being realized. Staff were able to capture \$255 thousand in one-time savings and an estimated recurring annual savings of \$1 million, in alignment with original project goals and expected savings.

The results of these project validation exercises will be used to improve project selection and prioritization to ensure that project investments achieve the maximum available energy reductions and/or financial savings. Moreover, this process may allow projects to be targeted toward facilities where the investment could result in the facility qualifying for even more favourable rebate or rate classification adjustments.

Facility Dashboarding

As noted in the Audit of [RCFS-BEEM](#), due to the decentralization of electricity accounts, gaps were identified in the dissemination of information on electricity consumption and spend within and across operational areas. As electricity is often one of the most significant facility-level costs, opportunities existed to improve how data is compiled, analyzed, and disseminated to the operational areas responsible for managing electricity use.

The Energy Management Office has worked with Facility Operations Services to customize reports to the Service Area's facilities and data requirements. These interactive reports provide Facility Operations the ability to monitor and track changes in consumption/spend and become familiar with each facility's unique seasonal or operational consumption trends. The reports also allow for benchmarking of facilities across departments and/or categories, such as fire stations or arenas, to provide departmental managers with detailed visibility into their facilities' electricity performance. Through data-driven energy management practices, staff will be able to make informed decisions on efficiency measures and operational changes to maximize energy efficiency and reduce overall electricity spend.

RURAL IMPLICATIONS

There are no rural implications associated with this report.

CONSULTATION

There is no public consultation required with this report.

ADVISORY COMMITTEE(S) COMMENTS

There are no comments or recommendations required by an Advisory Committee for this report.

LEGAL IMPLICATIONS

There are no legal impediments to receiving this report for information.

RISK MANAGEMENT IMPLICATIONS

There are no risk management implications associated with this information report.

ASSET MANAGEMENT IMPLICATIONS

The recommendations documented in this report are consistent with the City's [Comprehensive Asset Management \(CAM\) Program](#) objectives. The implementation of the Comprehensive Asset Management program enables the City to effectively manage existing and new infrastructure to maximize benefits, reduce risk, and provide safe and reliable levels of service to community users. This is done in a socially, culturally, environmentally, and economically conscious manner.

As referenced in this report, a project selection committee consisting of representatives from Facility Operations Services, Infrastructure Services (including Asset Management staff), Energy Evolution and the Energy Management Office was established to help align potential projects with greater corporate objectives. This has included, among other things, the incorporation of greenhouse gas reduction opportunities to better align project selection with the City's Climate Emergency goals. This systematic process will help to standardize the project selection process and better articulate the true cost and benefits of each opportunity.

FINANCIAL IMPLICATIONS

In 2020, these activities resulted in one-time savings of approximately \$255 thousand and estimated recurring annual savings of \$1 million, in addition to a further \$3.5 million

in cost avoidances. Cost avoidances describe costs that would have been incurred if a specific action had not been taken.

Over and above the activities of the Energy Management Office, the COVID-19 pandemic also had a significant impact on electricity consumption and costs in 2020. As a result of reduced electricity consumption at a number of City facilities, the City attained a one-time year over year savings of \$3.1 million. In addition, the introduction of [Ontario Regulation 191/20](#) will contribute an additional cost avoidance of \$4.2 million to be realized in 2021.

ACCESSIBILITY IMPACTS

The Corporate Energy Management Office supports and considers the *Accessibility for Ontarians with Disabilities Act, 2005* in its operations. This report is presented for information only and has no associated accessibility impacts.

TERM OF COUNCIL PRIORITIES

As described in this report, the Energy Management Office aligns with the 2019-2022 Term of Council Priorities of Service Excellence Through Innovation and Environmental Stewardship.

DISPOSITION

Report forwarded for information.