

Integrated Energy Management and Performance Standards for Existing Buildings

ISSUE

Civic buildings account for 40% of the total corporate greenhouse gas emissions annually and there has been a 0.7% emission reduction in this sector between 2014 and 2017.

Integrated energy management and performance standards for existing buildings are important to reduce energy consumption and greenhouse gases (GHG), as well as progress the actions and meet the targets set out in the Low Emissions Community (LEC) Plan. A key aspect of an integrated energy plan are green building certification standards for existing civic buildings to improve operational and environmental performance.

The following report outlines the status and future program plan for civic energy management programs, civic building standards, and projects.

BACKGROUND

At its meeting held on December 7, 2020, the Standing Policy Committee on Environment, Utilities and Corporate Services, considered *the Facility Improvement Program: Energy Performance Contract (FIP-EPC) Update*, and resolved that the report be received as information.

At its meeting held on June 28, 2021, City Council considered the *High Performance Civic Building Approach* and resolved:

- “1. That Option 1B – LEED Silver Certification is defined as the minimum standard for the design and construction and major renovation of applicable buildings in the High Performance Civic Building Policy;
2. Mandatory LEED credits for the construction of new civic buildings are permitted in the High Performance Civic Building Policy; and
3. The energy and air tightness targets and timeline recommended in Option 3D are included in the High Performance Civic Building Policy.”

The performance of civic facilities is addressed in *Council Policy C02-036, Environmental Policy* (updated 2015), which lists an objective that guides the development and implementation of programs, initiatives, and services:

“To design, construct, retrofit, and operate new and existing City facilities so that reduced environmental impacts are considered through all phases of life by incorporating: energy efficiency, water conservation, waste minimization, energy generation that reduces greenhouse gas emissions, pollution prevention, and investments in indoor environmental quality.”

The *Corporate Asset Management Plan: Saskatoon Facilities (2021)* includes the following conclusion from a Triple Bottom Line Assessment perspective:

“Continuous improvement of existing facilities in energy conservation and future deep energy retrofits will be required.”

The City of Saskatoon (City) has had a base program for energy management in place since 2008. Prior to the LEC Plan, the projects and programs were directed and categorized in the *Energy and Greenhouse Gas Management Plan (2009)*.

CURRENT STATUS

The City purchases energy (electricity and natural gas) to operate and maintain operational requirements and indoor environmental conditions in all City facilities. Energy costs increase each year and have grown with the implementation of the federal carbon charges starting in 2019. The City develops energy management projects and programs to improve the energy efficiency and lower the energy costs of civic buildings, while maintaining a comfortable working environment for building occupants.

The current energy management program provides services for many city facilities, which include: office buildings, police headquarters, fire halls, leisure centers, outdoor pools, Remail Modern, Nutrien Wonderhub and other recreational facilities such as spray pads and paddling pools. Exclusions are Saskatoon Water, Saskatoon and Light and Power, Sasktel Centre and TCU Place.

The City’s energy management program provides the following benefits and services:

- Managing operational costs associated with facility energy consumption;
- Providing access to energy and utility data for budget developments;
- Analyzing utility bills and billing data to better manage utility costs and budgets for civic facilities and understand energy use and emissions in civic facilities;
- Identifying energy conservation projects to reduce corporate GHG emissions;
- Monitoring and verification of savings from energy retrofit projects;
- Supporting internal stakeholders with management decisions on future energy projects, operations, and energy procurement to improve building operations;
- Managing natural gas supply contracts to ensure cost-effective procurement;
- Applying for new utility services and coordinating utility meter replacements;
- Identifying and correcting billing errors or excessive consumption;
- Responding to energy and utility inquiries from internal and external stakeholders for building energy use surveys, annual GHG reporting, carbon charges evaluation and impacts, scenario analysis for COVID Impacts or other operational changes, and utility rate forecasts; and
- Applying for external grants and funding opportunities related to energy management and reduction of energy use within facilities.

DISCUSSION/ANALYSIS

The 2022-2023 Multi-year Budget and Business Plan includes a business plan option to support the Integrated Energy Management and Performance Standards for Existing Buildings project. The integrated civic energy management plan includes piloting performance standards for four existing buildings and builds on the technical actions developed through the current energy management program and technical improvements underway through the ongoing FIP-EPC capital project.

Integrated Civic Energy Management

The next phase for the City's energy management involves the development of an integrated civic energy management plan to continuously improve the program, advance corporate emission reductions, and consider additional opportunities for operational savings. Integrated energy management principles are illustrated in Appendix 1 - Integrated Energy Management Plan Framework Graphic, and the plan development would be guided by *National Resources Canada Energy Master Plan – An Introduction to Establishing an Effective Energy Master Plan Guide*.

The principles are aligned through both technical and organizational principles. This underscores the importance of people in the implementation and maintenance of the technical solutions and includes organizational aspects to develop a better corporate management system. This integrated approach includes equipment improvement-based solutions and creates a more inclusive strategy that establishes roles, actions, resources, and accountability throughout the corporation. Integrating the organizational, technical, and behavioural aspects of energy use highlights the importance of working together to achieve and maintain long-term savings from energy efficiency programs and projects.

Technical components include:

- Data collection and analysis;
- Technical actions;
- Setting savings targets; and
- New operations and maintenance practices.

Some of the organizational components in the framework are:

- Identifying energy champions and energy teams;
- Best practice review;
- Management system review;
- Resource needs analysis; and
- Capacity-building and training.

Performance Standards for Existing Buildings

A key aspect of the integrated plan is to pilot high performance building certification standards for existing buildings to improve operational and environmental performance and progress LEC Actions. The primary outcomes anticipated with high performance building certification standards for existing buildings are:

- policies;
- management practices;
- baselines;
- benchmarking; and
- ongoing evaluation of performance.

High performance building certification standards for existing buildings address the following areas of environmental performance and management:

- energy;
- water;
- air;
- comfort;
- health and wellness;
- custodial;
- purchasing;
- waste;
- site; and
- stakeholder engagement.

To achieve long-term energy, water and waste reductions, civic facilities with a performance management system in place can more effectively set specific operational targets and track progress. Specifically, the certification pilot will help to identify and manage facility performance which assists with understanding the improvements required to achieve the performance outlined in the LEC Plan.

Capital Project Summary

Project components in the business plan option include:

- Developing an Energy Team;
- Creation of an integrated civic energy management plan;
- Energy management training and education program planning;
- Appliance inventory and replacement plan; and
- Piloting Performance standards for four existing buildings.

Phases outside of the scope of this project, but are planned for future phases include:

- Appliance upgrades;
- Energy management training and education program implementation;
- Other energy projects; and
- Facility recommissioning.

The integrated energy management program would provide the resources and processes to accomplish the LEC Actions related to corporate energy reductions and GHG targets. Integrated energy planning and management would allow the City to accelerate meaningful change in the way energy is managed by adopting best practices and formalizing collaboration across Departments. In making energy performance visible, various levels of the organization can take action to systematically improve energy efficiency and reduce energy consumption and costs.

In combination with the High Performance Civic Building Policy for new construction, the certification pilot and standards for existing buildings provides a wholistic approach to the life cycle facility planning from design to operation. The cross-departmental and integrated position builds on the success of the one-city approach championed within the organization.

FINANCIAL IMPLICATIONS

The Integrated Civic Energy Management Program with Performance Standards for Existing Buildings project in the 2022-2023 Multi-Year Budget and Business Plan proposes \$245,000 in 2022 and \$290,000 in 2023 in capital funding. Operating funds may be requested for the 2024-2025 budget cycle for implementation if a green building certification program is proposed to proceed.

The capital resources would provide an opportunity to pursue additional funding from the Federation of Canadian Municipalities' Green Municipal Fund – Community Buildings Retrofit – community building, monitoring and analysis grant for a feasibility study (up to \$25,000). Other external funding opportunities will continue to be reviewed as they become available.

If implemented, the program will provide savings and reduce risks due to increasing utility rates and carbon charges. Energy consumption is directly linked to the expense of carbon charges since it is a volumetric charge and reducing energy consumption reduces the impact of the rising charges. In 2019, federal carbon charges started at \$20/tonne of CO_{2e} and an annual \$10-15/tonne increase is projected until it reaches \$170/tonne CO_{2e} in 2030.

OTHER IMPLICATIONS

Environmental

Energy management and efficiency reduces GHG emissions since both heating sources and the current electrical grid rely on fossil fuels. The LEC Plan sets out 40 emission-reduction actions that are based on the sequence stages of:

- (1) Reduce Energy Consumption.
- (2) Improve Energy Efficiency.
- (3) Switch to Renewable Energy Supply.

Energy conservation and reductions are a required first step to many actions in the LEC Plan. The sequence is important since the reduction and improvement of energy consumption within buildings will require smaller capacity for renewable energy systems. LEC Action 3 in the plan is to upgrade energy conservation behaviors in municipal buildings.

Triple Bottom Line

The energy management program aligns with the City's sustainability priorities and helps the City achieve more Triple Bottom Line outcomes. Key benefits include:

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- Environmental – Supporting climate change mitigation and adaptation by conserving energy and reducing emissions related to facilities.
- Economic – Improving City efficiencies provides value by decreasing risk and escalations due to rising utility rates and carbon charges.
- Governance – Helping the City achieve its climate change targets and commitments and positioning education and communication for energy related topics.

Facilities Asset Management

A changing climate has consequences for facility assets and there are opportunities for improvements in environmental performance. Energy Management is well suited to assist with and is aligned with current asset management strategies.

NEXT STEPS

Program development would continue, dependent upon approval of the capital funding identified in the 2022-2023 Multi-year Budget and Business Plan business plan option for the Integrated Civic Energy Management Program and Performance Standards for Existing Buildings.

The High Performance Civic Building Policy for New Buildings is planned to be presented to City Council in November 2021.

APPENDICES

1. Integrated Energy Management Plan Framework Graphic

Report Approval

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