



**STAFF REPORT
ACTION REQUIRED**

**Corporate Energy Conservation & Demand Management
Plan (2014-2019) - Green Energy Act - Regulation 397/11**

Date:	June 9, 2014
To:	Parks and Environment Committee
From:	Director, Environment & Energy Division
Wards:	All
Reference Number:	P:\2014\Internal Services\E&E\Pe14005e&e – (AFS19340)

SUMMARY

The Government of Ontario enacted the Green Energy Act Regulation 397/11 on January 1, 2012. This legislation requires the City of Toronto to develop and publish a five-year Energy Conservation and Demand Management (ECDM) plan by July 1, 2014. The regulation requires senior management approval of the plan prior to publication. For the past year, the Energy & Waste Management Office within the Environment and Energy Division has been leading efforts to complete this plan and report.

The City of Toronto has a large quantity of facilities under its internal portfolio of buildings and operations. Accordingly, a benchmarking approach to classify opportunities and prioritize future projects was adopted for the development of the ECDM plan. The report is comprised of various building types related to individual divisions. Where sensible, facilities with similar operations under multiple divisions were grouped. Comparison of energy consumption enabled this analysis to estimate energy savings based on potential operational improvements and equipment retrofits to achieve top quartile performance in each building type category. The analysis projects opportunities to cut facility energy consumption by approximately 30 per cent resulting in annual cost savings of over \$17 Million with an average payback period of less than 8 years.

RECOMMENDATIONS

It is recommended that:

1. City Council agree that the Energy Conservation and Demand Management (ECDM) Plan will be used as the foundation for developing energy conservation and demand management projects in City facilities for the next five years. The executive summary of the ECDM plan has been attached as Appendix 'A'. The full ECDM report containing individual divisional sections can be electronically accessed at: <http://insideto.toronto.ca/fred/ewm/ecdm.pdf>
2. City Council direct the Environment & Energy Division to continue leading the projects associated with the City's Energy Conservation and Demand Management Plan and assist the City's Agencies, Boards, Commissions and Divisions in the achievement of proposed targets.
3. City Council request the City's Agencies, Board, Commissions and Divisions to actively participate in further identification and implementation of energy conservation and demand management projects.

Financial Impact

There are no direct financial impacts at this point in the plan. It is anticipated that approved projects will be financed through energy savings generated from the projects. City Council has previously approved the use of recoverable debt to finance these types of projects. As projects are developed they will be identified for inclusion in divisional annual capital budget process. Total project costs are estimated at \$142 million which will be financed from annual projected savings of \$17 million resulting in a payback period of about 8 years.

The Chief Financial Officer has reviewed this report and agrees with the financial impact information.

DECISION HISTORY

In addition to the Energy Conservation and Demand Management (ECDM) plan, the Green Energy Act's Regulation 397/11 requires City of Toronto to annually report on the energy consumption and greenhouse gas emissions of its facilities. The first of such reports was published by the Energy and Waste Management Office in July 2013. This report enabled identification of high energy consuming facilities in the City's portfolio. For further information and an electronic copy of the abovementioned report refer to: www.toronto.ca/environmentactionplans

ISSUE BACKGROUND

In July 2007, Toronto City Council adopted the recommendations made by the "Climate Change, Clean Air and Sustainable Energy Action Plan". This plan made a commitment to optimization of energy efficiency at City facilities.

In November 2009, Toronto City Council adopted the recommendations made by the Toronto Environment Office in a report entitled "The Power to Live Green". This report requires City of Toronto to achieve an 80 per cent reduction in greenhouse gas emissions from 1990 levels by 2050.

Accordingly, the City of Toronto's obligations under the Green Energy Act are in line with the commitments previously made by the City Council. The Energy Conservation and Demand Management (ECDM) Plan is another step in consolidating the associated conservation efforts within City facilities to meet previously adopted commitments by City Council. For further information and copies of the above mentioned reports refer to: www.toronto.ca/environmentactionplans

COMMENTS

The City has been successfully investing in energy conservation and demand management for more than a decade with a succession of projects across a number of different building types. The Energy & Waste Management Office (EWMO) within the Environment and Energy Division has the mandate to implement energy saving projects at City facilities. The most recent projects completed by EWMO have been implemented through the Energy Retrofit Program which was in place from 2007 to 2013. This program was successful and has resulted in energy savings of approximately \$5 Million annually.

To encourage ongoing Public Sector energy efficiency improvements, the Ontario Ministry of Energy enacted Regulation 397/11 in January 2012 as part of the Green Energy Act. This regulation requires all public sector entities to submit to the Province their annual energy consumption and greenhouse gas emissions by July 1, 2013. As a second deliverable, under this regulation all public sector entities are required to prepare and publish their five year Energy Conservation and Demand Management Plans by July 1, 2014.

The City's five year Energy Conservation and Demand Plan (2014-2019) addresses this requirement and provides a framework for the City to plan its next phase of energy efficiency improvements. The ECDM report can be electronically accessed at: <http://insidetoronto.ca/fred/ewm/ecdm.pdf>

Scope of Plan

This new plan addresses 478 buildings from fifteen City Agencies, Boards, Divisions and Commissions which together spent over \$53 Million on electricity and natural gas in 2012. The buildings addressed in this plan together cover over 19 million square feet. The analysis completed to date projects opportunities to cut facility energy consumption by approximately 30 per cent resulting in annual cost savings of over \$17 Million with an average payback period of less than 8 years. The resulting energy conservation will enable City of Toronto to reduce its greenhouse gas emissions by nearly 32,000 tons. In cases where replacement of old equipment is required, the return on investment is higher based on the combination of energy conservation and State of Good Repair (SOGR) projects.

Of the 528 facilities covered by this report, 37 are larger than 100,000 square feet in area and account for about 45 per cent of the total area covered by this project. As well, 47 facilities with the highest energy savings potential account for approximately 57 per cent of the total projected savings. The table below illustrates further details based on individual Agencies, Divisions or building type covered by the report:

Facility Type	No. of Facilities	Total Indoor Area (Square feet)	Current Utility Costs	Potential Cost Savings	Current GHG Emissions (Tonnes)
Administrative offices and related facilities	51	4,846,672	\$13,881,969	\$ 4,549,000	6,868
Ambulance stations and associated facilities	24	216,311	\$ 826,017	\$ 347,000	421
Children's Services	9	64,186	\$ 175,118	\$ 48,000	146
Community centres	70	2,033,543	\$ 5,264,057	\$ 2,348,000	4,365
Cultural facilities	20	596,553	\$ 1,456,676	\$ 448,000	926
Fire stations and associated facilities	88	836,816	\$ 1,803,241	\$ 581,000	1,250
Indoor recreational facilities	46	1,477,712	\$ 5,480,724	\$ 2,585,000	5,022
Indoor sports arenas	27	862,996	\$ 3,179,954	\$ 1,210,000	1,672
Indoor swimming pools	7	214,077	\$ 848,637	\$ 267,000	854
Long-Term Care Homes and Services	10	1,622,285	\$ 4,970,849	\$ 335,000	1,877
Performing arts facilities	3	430,370	\$ 919,121	\$ 155,000	323
Police services facilities	39	2,589,421	\$ 6,056,101	\$ 1,200,000	1,467
Public libraries	73	1,548,904	\$ 4,505,251	\$ 1,879,000	2,887
Service Yards & Storage Facilities	50	1,740,016	\$ 3,299,559	\$ 1,059,000	2,904
Shelter, Support and Housing Administration	11	280,617	\$ 822,856	\$ 228,000	911
TOTAL	528	19,360,480	\$53,490,130	\$17,239,000	31,893

Methodology:

Target setting methodology used for the ECDM report was based on building energy consumption from top-quartile energy performers under individual building types. The corresponding result was used to set energy performance targets for the remaining 75 percent of the buildings within the group. The target-setting methodology breaks down potential savings into year-round and seasonal (winter or summer) electricity and

gas use, which help narrow down measures most likely to be appropriate for each scenario.

An initial set of possible energy conservation measures has been included in individual reports, customized to each building type. These measures have been organized by type (mechanical, lighting, electrical, envelope and process) and categorized as behavioural, operational or retrofit/capital. Other factors such as ease of implementation, savings potential and suggested timeline have been also accounted for.

Implementation and Budgeting:

Past project costs combined with implementation information were used to establish preliminary timelines and budgetary financial analysis. The budgets allow for saving measures such as:

- Lighting retrofits and associated controls
- Mechanical system modifications and efficiency improvements
- Appliance replacement and controls
- Localized efficiency measures for the building envelope

Estimated project costs also include energy audits, staff training, measurement and verification of actual savings as well as additional maintenance costs associated with incorporation of new technology and operating practices. Projected borrowing costs and inflation have also been accounted for in cash flow analyses presented throughout the report. Accordingly, the overall ECDM project cost is estimated at just over \$142 million.

The Plan will initially focus on facilities with highest conservation potential. The following steps will enable identification and implementation of specific projects at these facilities in the next five years:

- Detailed energy audits to determine more specific opportunities along with the required analysis and engineering to assess technical and financial benefits;
- Divisional review of the proposed opportunities including low cost operational improvements to ensure maximized energy savings as well as commitment to undertake energy retrofit and conservation projects;
- Inclusion of projects in the divisional capital budget process;
- Implementation and project management of the agreed upon projects;
- Staff training and implementation of improved operational and maintenance practices; and
- Measurement, verification and reporting on the energy savings achieved from completed projects and operational improvements.

CONCLUSIONS

The City of Toronto has a strong history in raising energy efficiency and lowering the carbon footprint of its own buildings. Over the past 10 years, the Energy & Waste Management Office has cumulatively avoided costs of approximately \$43 million attributed to the implementation of energy retrofit projects.

The Energy Conservation and Demand Management reports have been shared with divisional representatives to allow an open and transparent approach and ensure inclusivity in the planning and application of energy conservation projects. Associated investment in additional capital and operational improvements will further reduce corporate energy consumption and greenhouse gas emissions. Building level analysis will define specific projects and justify the required investments based on associated savings.

The results will reinforce City of Toronto's position as a leader in energy efficiency and climate change mitigation among North American cities, while upgrading the energy performance of the City's facilities.

CONTACT

Jim Baxter, P.Eng.
Director, Environment & Energy Division
(416) 338-1295
Jbaxter2@toronto.ca

SIGNATURE

Jim Baxter, P.Eng.
Director, Environment & Energy Division

ATTACHMENTS

Appendix "A"
Executive Summary - Energy Conservation and Demand Management (ECDM) Plan