TO:	**CHAIR AND MEMBERS CIVIC WORKS COMMITTEE MEETING ON JULY 21, 2014**
FROM:	**JAY STANFORD, M.A., M.P.A. DIRECTOR, ENVIRONMENT, FLEET & SOLID WASTE**
SUBJECT:	**UPDATES: CORPORATE ENERGY MANAGEMENT PROGRAM AND CONSERVATION AND DEMAND MANAGEMENT (CDM) PLAN**

RECOMMENDATION

That on the recommendation of the Director, Environment, Fleet & Solid Waste the following actions **BE TAKEN**;

a) The updates to the Corporate Energy Management Program **BE RECEIVED** and posted on the City's Corporate Energy Management website; and

b) The Corporate Energy Conservation and Demand Management (CDM) Plan **BE APPROVED** and posted on the City's Corporate Energy Management website as per the requirements of the Ontario Ministry of Energy under the *Green Energy Act, 2009.*

c) The remainder of this report **BE RECEIVED** for information.

PREVIOUS REPORTS PERTINENT TO THIS MATTER

Relevant reports that can be found at www.london.ca under City Hall (Meetings) include:

- Community Energy Action Plan – Final Draft for Community Engagement (December 9, 2013 meeting of the Civic Works Committee, Agenda Item # 8)
- Update on Corporate Energy Management & Reporting Requirements (October 7, 2013 meeting of the Civic Works committee, Agenda Item # 6)

BACKGROUND

PURPOSE

The purpose of this report is to provide the Civic Works Committee and Council with:

- An update on the City of London Corporate Energy Management Program; and

- A copy of the new Corporate Energy Conservation and Demand Management (CDM) Plan required by the Ontario Ministry of Energy under the *Green Energy Act, 2009* and *Ontario Regulation 397/11* including:
  - a description of actions taken to assist in establishing the required targets incorporated into the CDM Plan by:
    - establishing baselines for past and current energy management activities; and
    - creating a strategy for energy reduction targets towards the five year CDM Plan;
  - A description on how the new CDM Plan will be implemented in two time periods:
    - 2014 to 2015
    - 2016 to 2019.

CONTEXT

Provincial Requirements for Energy Management
In August 2011, the provincial government introduced *Ontario Regulation 397/11* under the *Green Energy Act, 2009*. This regulation requires Municipalities, Municipal Service Boards, Schools Boards, Universities, Colleges and Hospitals to report on their energy consumption and

associated greenhouse gas (GHG) emissions annually beginning in 2013. The affected public agencies are also required to develop and implement five-year CDM plans starting in 2014. The intent of the regulation is to help broader public sector organizations better understand their energy consumption, to help them benchmark energy use and to encourage energy conservation and demand management activities within them.

In compliance with the requirements of the *Green Energy Act, 2009* and *Ontario Regulation 397/11*, the City of London submitted its 2011 energy consumption and greenhouse gas emissions report by the July 1, 2013 deadline. Going forward the City is required to submit each calendar year an annual consumption and greenhouse gas emissions report for buildings or facilities it owns or leases that:

a) Are heated or cooled and in respect of which the public agency is issued the invoices and is responsible for making the payments for the energy consumptions; or

b) Are related to the treatment or pumping of water or sewage and in respect of which the public agency is issued the invoices and is responsible for making the payments for the energy consumptions.

In compliance with the *Green Energy Act, 2009*, the City submitted its 2012 energy consumption and greenhouse gas emissions report to meet the July 1, 2014 deadline. The prescriptive report provided by the Ministry of Energy can be reviewed in an online format on the City of London Corporate Energy Management website. The City is also required to prepare and post a CDM Plan to encourage energy conservation and demand management activities by outlining a strategy for energy reduction targets and identifying future conservation potentials and measures.

DISCUSSION

This report contains details in two key sections highlighted below and contained in the report Appendices A and B, and separate reports found on the City's website:

- Part A - Corporate Energy Management Program – an update on the program with emphasis placed in the period 2007 until 2013. Previous pertinent reports are available on the Corporate Energy Management website.

- Part B - Corporate Energy Conservation and Demand Management (CDM) Plan – this is a new report required to meet the reporting requirements of the Ministry of Energy.

PART A - Corporate Energy Management Program

The City's Corporate Energy Management Program was expanded in 2007 and is based on six key focus areas:

1. Tracking & monitoring energy consumption;
2. Renewable energy and feasibility projects;
3. Leadership in Energy and Environmental Design (LEED) Buildings;
4. Energy conservation and demand management projects;
5. Energy procurement; and
6. Creating a corporate "culture of conservation".

Highlights from 2007 to 2013 (Appendix A)

- The City of London Corporate Energy Management Program, expanded in 2007, contains six key focus areas and many initiatives already undertaken that contribute significantly to the requirements of the Ministry of Energy's *Green Energy Act, 2009* and *Ontario Regulation 397/11.*

- Overall, energy costs continue to rise. Energy costs have increased by 9 percent between 2012 and 2013, and 23 percent overall from our baseline records in 2007. The City uses electricity, natural gas, gasoline and diesel fuel, and steam & chilled water for its operations, and most of the increased energy costs are associated with electricity, gasoline and diesel.

- Although the Corporation continues to experience increases in energy costs, the Corporation has reduced its overall energy consumption by 5 percent from 2007 levels. These reductions can be attributed to recent energy conservation measures and facility upgrades.

- In terms of energy use in service delivery to Londoners, several years of data show continued improvement of corporate energy use per capita with a 9.4 percent reduction compared to 2007. In 2013, the City of London's population has grown by almost 5 percent (17,000 people) compared to 2007 baseline records. In 2014 the average corporate energy consumption per person based on London's population was 508 equivalent kilowatt-hours (ekWh) versus 561 in 2007.

- Greenhouse gas (GHG) emissions from facility and infrastructure energy use are 6 percent lower between 2012 and 2013, and 41 percent lower (18,200 tonnes) in 2013 compared to 2007 due to increased conservation efforts and cleaner sources of energy used to generate electricity in Ontario.

- The introduction of the Ministry of Energy requirements presents opportunities for the City to review its program initiatives and proposed energy targets annually and over the next five years through the Corporate Energy Conservation and Demand Management (CDM) Plan.

PART B – City of London Corporate Energy CDM Plan

Requirements of CDM Plan

The City of London is also required to prepare and post a CDM Plan as a guideline to encourage energy conservation and demand management activities by outlining a strategy for energy reduction targets and identifying future conservation potentials and measures. The required elements that must be included in the CDM Plan are:

- Information regarding the public agency's annual energy consumption during the last year for which complete information is available for a full year;

- The public agency's goals and objectives for conserving and otherwise reducing energy consumption and managing its demand for energy;

- The public agency's proposed measures, the cost and saving estimates for these proposed measures, and the estimated length of time these measures will be in place.

- A description of any renewable energy generation facility operated by the public agency and the amount of energy produced on an annual basis by the facility. This should also include a description of:
  - Ground source energy harvested;
  - Solar energy harnessed, if any, through thermal air technology or thermal water technology; and
  - Proposed plans, if any, to operate heat pump technology, thermal air technology or thermal water technology in the future.

- Confirmation that the public agency's senior management has approved the CDM Plan.

Key Principles in Preparing the CDM Plan

The following four key principles were part of the foundation on the development of the CDM Plan with further elaboration provided on the table on the next page:

1. Budget – No new budget is being requested to deliver the proposed CDM Plan and the 10 percent reduction target by 2020
2. Incentive Opportunities in Energy Conservation and Sustainable Energy
3. Economic Development and Business Opportunities in Corporate Energy Conservation and Sustainable Energy Projects
4. Level of Commitment

Key Principle	Description
1. Budget – No new budget is being requested to deliver the proposed CDM Plan and the 10 percent reduction target by 2020	• Since the expansion of the Corporate Energy Program in 2007, the City of London has assigned an annual budget of between $300,000 to $600,000 towards the program and the associated costs for energy management staff, feasibility studies, and other consulting costs. The City has also invested between $250,000 and $1 million per year related to energy-efficiency projects. • Our approach to energy efficiency improvements is to maximize existing budgets identified within the Asset renewal projects scope of work such as the work currently underway with Canada Games Aquatic Centre and process upgrade projects such as sludge dewaterers at Greenway Wastewater Treatment Plant. • The CDM Plan has been designed to achieve its targets based on the current Corporate Energy Management Program and budget allocation.
2. Incentive Opportunities in Energy Conservation and Sustainable Energy	• Improvements in energy efficiency help to offset the pressures of energy prices placed on operating budgets. The City has been very active in pursuing grants and incentives that are made available by provincial & federal governments, London Hydro, Union Gas and the Federation of Canadian Municipalities (FCM). • The City has applied for and received over $1 million in incentive funding since 2006 and this number continues to grow.
3. Economic Development and Business Opportunities in Corporate Energy Conservation and Sustainable Energy Projects	In addition to the corporate energy cost savings and/or cost avoidance associated with corporate energy management activities, energy projects also generate economic development and business activity in London. Examples of this include: • Energy retrofits of municipal buildings are primarily carried out by London area service providers, and can also generate demand for London area suppliers of energy-saving products. • Green municipal building projects, such as the Stoney Creek Community Centre, provide opportunities for London area product and service providers to increase their capacity to deliver these products and services to other London area businesses and institutions. • Technology demonstration projects, such as LED lighting trials on London roadways and parking lots, allows this technology to be tested in local conditions against existing standards often based on older technologies. • Municipal renewable energy projects provide London area product and service providers with experience in undertaking projects that help to expose unexpected challenges, such as transmission grid constraints and technology standards developed for older technologies that can then be addressed and/or taken into account for future projects.
4. Level of Commitment	• The level of commitment towards the CDM Plan depends on the level of commitment by Council, senior management and staff at the City of London. In recent years, commitments towards energy conservation have proven to be a challenge based on budget discussions and the continued reduction in energy conservation budget funding. • As noted above, energy efficiency measures are incorporated in to major projects in asset renewal, new construction, and process improvement projects to maximize existing budgets. Obtaining the current level of financial and resources commitment over the next five years is required to achieve a 10 percent reduction in total annual energy use by 2020. With the nature of our business, this target may be subject to change if endorsement changes. • In summary, the purpose of the CDM plan initiative from Ministry of Energy is to show the City of London's commitment towards conservation and demand management, the only penalties would be "self-inflicted" by potential higher energy consumption and future operational cost.

Highlights of the CDM Plan (Appendix B and CDM Plan report on City's website)

The City of London Corporate Energy CDM Plan will be a "living document" in that the actions taken towards conservation and demand management activities are designed to build from one year to the next over the five year period. The highlights of the CDM Plan are as follows:

- The CDM Plan required by the Ontario Ministry of Energy under the *Green Energy Act* and *Ontario Regulation 397/11* includes:
    - a description of actions taken to assist in establishing the required targets incorporated into the CDM Plan by:
        - establishing baselines for past and current energy management activities; and
        - creating a strategy for energy reduction targets towards the five year CDM Plan;
    - A description on how the new CDM Plan will be implemented in two time periods:
        - 2014 and 2015 (13 measures/actions)
        - 2016 to 2019 (22 measures/actions)
- The CDM Plan proposes a goal of an additional 10 percent reduction in overall annual energy use by 2020. The significance of a reduction of this magnitude in overall energy consumption compared to a business-as-usual approach (from 2013) is estimated as follows:
    - Energy cost avoidance of an approximate $4 million per year by 2020 if an overall 10 percent reduction goal is achieved;
    - Energy use reduction of approximately 30 million ekWh per year;
    - Service delivery energy efficiency improvement of 15 percent, in terms of annual average energy consumption per person; and
    - Greenhouse gas emissions reduction from facility and infrastructure energy use of approximately 3,900 tonnes of CO_2e per year by 2020.
    - It is worth noting that many municipalities are selecting a 10 percent reduction target.
- The City's approach to energy efficiency improvements to meet the goals identified in the CDM Plan will be achieved by maximizing the current budgets assigned and by pursuing incentive opportunities made available by provincial, federal governments and local agencies.
- Currently no additional dollars are being requested with this plan. An increase beyond the proposed 10 percent reduction target will require additional capital and operational investments.
- The success of the CDM Plan will depend on the level of commitment by Council, senior management and staff at the City of London. The 10 percent reduction commitment is a target that is subject to changes in the nature of our business. The target will be reviewed on an annual basis and may be subject to change if endorsement changes.

ACKNOWLEDGEMENTS:

This report was prepared with the assistance of Jamie Skimming, P.Eng, Manager, Air Quality and Steven MacDonald, P.Eng, Corporate Energy Management Engineer.

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Appendix A Update - Corporate Energy Management Program

Appendix B Corporate Energy Conservation and Demand Management (CDM) Plan

Documents found on the City of London website (www.london.ca):

2014 NEW - Corporate Energy Conservation and Demand Management (CDM) Plan
2012 NEW - Energy Consumption and Greenhouse Gas Emissions (Ministry of Energy)
2013 Past and Current Energy Management Activities
2013 Culture of Conservation – The Next Steps
2012 Corporate Energy Consumption Report
2011 Corporate Energy Consumption Report
2011 Energy Consumption and Greenhouse Gas Emissions (Ministry of Energy)

c Members of the City of London Energy Management and Conservation Team (EMCT):

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Appendix A

Update - Corporate Energy Management Program

Background

Since 2007, the City's Corporate Energy Management Program has had six key focus areas;

1. Tracking & monitoring energy consumption;
2. Renewable energy and feasibility projects;
3. Leadership in Energy and Environmental Design (LEED) Buildings;
4. Energy conservation and demand management projects;
5. Energy procurement; and
6. Creating a corporate "culture of conservation".

In September 2013, City staff captured the past achievements and current activities for all of the Corporation's energy needs. The five completed documents are available on the City of London Corporate Energy Management website. The supporting documents identify the significant amount of work that has been undertaken to date on corporate energy management and build upon previous submissions in the last ten years to Committee and Council. The documents are summarized below:

Document	Description
Past and Current Corporate Energy Management Activities	This document summarizes a selection of the significant energy management projects and supporting initiatives completed between 1990 and 2012 that have set the stage to capture the City of London's contributions in corporate energy management activities.
Culture of Conservation – The Next Steps	The document focuses on the enhancement of the existing *energyMatters* program to engage and educate City of London staff on what roles they can take to save energy.
2011 Corporate Energy Consumption Report	The 2011 Corporate Energy Consumption Report provides a summary of the City of London's 2011 annual energy consumption and GHG emissions for all operations. The document provides a total of all significant energy costs associated with City of London operations. In addition to the report requirements mandated by the *Green Energy Act, 2009 and Ontario Regulation 397/11,* information on all energy consuming infrastructure (e.g., street lighting, sports fields) as well as fleet fuel has been included to provide a complete picture of energy needs for our municipal operations.
2011 Energy Consumption and Greenhouse Gas Emissions (Ministry of Energy)	The Energy Consumption and Greenhouse Gas Emissions Template is provided to public agencies by the Ministry of Energy. In order to comply with the reporting requirements of Regulation 397/11 under the *Green Energy Act, 2009,* beginning in 2013, public agencies must submit their energy consumptions and GHG emissions annually using the template provided by the Ministry.
2012 Corporate Energy Consumption Report	The 2012 Corporate Energy Consumption Report provides a summary of the City of London's 2012 annual energy consumption and GHG emissions for all operations. The document provides a total of all significant energy costs associated with City of London operations. In addition to the reporting requirements mandated by the *Green Energy Act, 2009 and Ontario Regulation 397/11,* information on all energy consuming infrastructure (e.g., street lighting, sports fields) as well as fleet fuel has been included to provide a complete picture of energy needs for our municipal operations.

Recent Energy Cost Savings/Cost Avoidance

This Corporate Energy Management Program has resulted in significant savings for the City of London. For example, through energy procurement strategies alone, since 2005 the City of London has actively mitigated the cost of electricity. As of 2012, the City of London has avoided over $6 million in accumulated electricity costs versus the use of the Provincial Government's Regulated Price Plan (RPP).

Year	Average Cost of Electricity ($/MWh)	Regulated Price Plan (RPP)	Electricity Savings as a Percentage	Avoided RPP Costs Paid by the City of London
2005	$51.42	$55.69	8.30%	$440,000
2006	$53.03	$63.14	19.10%	$1,036,000
2007	$54.35	$62.03	14.10%	$771,000
2008	$53.50	$59.99	12.10%	$687,000
2009	$59.68	$65.71	10.10%	$654,000
2010	$64.81	$72.61	12.04%	$800,278
2011	$68.53	$77.33	12.84%	$988,384
2012	$73.66	$81.77	11.01%	$876,000

The existing Corporate Energy Management Program has been successful since 2007 for the City of London but has room for improvement and areas that require more attention. Although the program has resulted in significant savings, there are some challenges with the program that limit the results:

- In the success and implementation of the Corporate Energy Management Program investment today in renewable energy projects and feasibility projects predict the success in the future energy savings.
- Uncontrollable factors, the economic market conditions and legislative changes that have resulted in significant operating budget costs;
- Legislative changes, incentive opportunities towards energy projects changing which impact saving opportunities; and
- Adoption of the program and City staff participation.

Recent Trends in Corporate Energy Use

The City is challenged with significant budgetary pressures from increased energy costs and reduced levels of funding. In terms of energy, the City is faced with costs which continue to increase and impact our city and local economy.

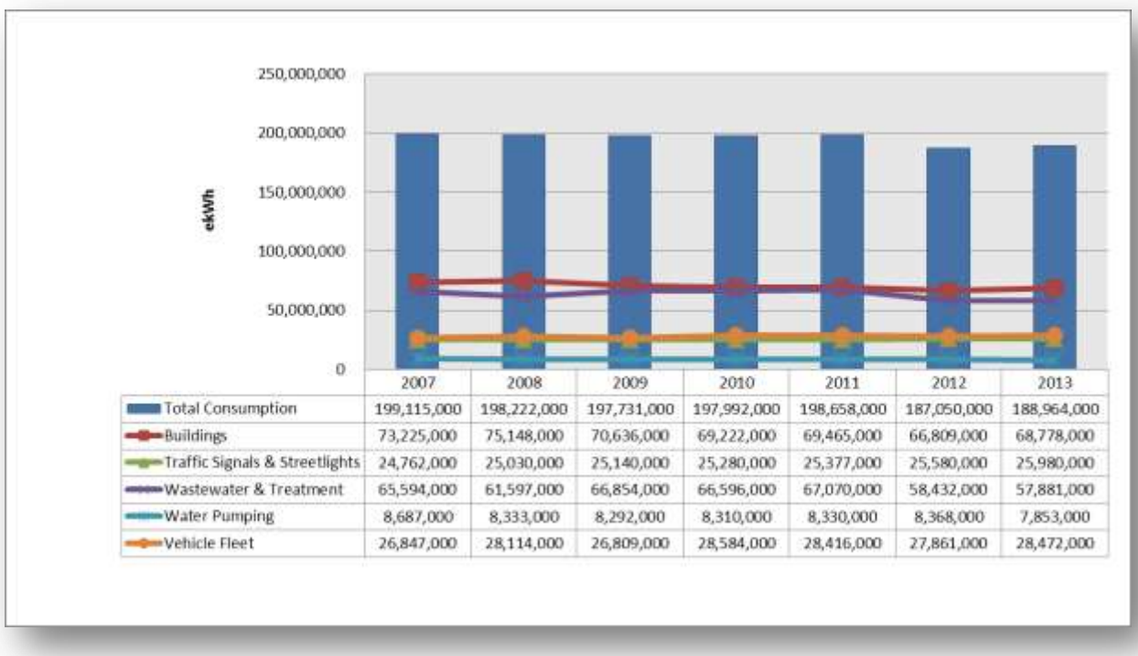
As noted in Figure 1 – Energy Costs, the City of London spent approximately $17.7 million in 2013 on its corporate energy needs. Energy costs have increased by 9 percent between 2012 and 2013, and 23 percent overall from our baseline records in 2007. The six energy costs measured include electricity, natural gas, gasoline, diesel fuel, steam, and chilled water and are identified in Figure 1.

Although the City of London continues to see increases in energy costs (Figure 1), as shown in Figure 2 – Energy Use, the Corporation has reduced its overall energy use by 5 percent from 2007 levels. This reduction can be attributed to recent energy conservation measures and facility upgrades.

Figure 1 - Energy Costs

	2007	2008	2009	2010	2011	2012	2013
Total Energy Consumption Cost	$14,345,000	$14,802,000	$14,057,000	$14,734,000	$16,577,000	$16,204,000	$17,709,000
Electricity	$9,289,000	$9,003,000	$9,466,000	$10,377,000	$12,021,000	$12,021,000	$13,429,000
Natural Gas	$2,350,000	$2,409,000	$2,251,000	$1,711,000	$1,421,000	$1,166,000	$1,051,000
Steam	$273,000	$275,000	$219,000	$198,000	$173,000	$145,000	$181,000
Chilled Water	$251,000	$283,000	$218,000	$235,000	$231,000	$178,000	$198,000
Diesel Fuel	$1,518,000	$2,078,000	$1,316,000	$1,564,000	$1,948,000	$1,897,000	$2,051,000
Gasoline	$664,000	$754,000	$587,000	$649,000	$783,000	$797,000	$799,000

Figure 2 - Energy Use



	2007	2008	2009	2010	2011	2012	2013
Total Consumption	199,115,000	198,222,000	197,731,000	197,992,000	198,658,000	187,050,000	188,964,000
Buildings	73,225,000	75,148,000	70,636,000	69,222,000	69,465,000	66,809,000	68,778,000
Traffic Signals & Streetlights	24,762,000	25,030,000	25,140,000	25,280,000	25,377,000	25,580,000	25,980,000
Wastewater & Treatment	65,594,000	61,597,000	66,854,000	66,596,000	67,070,000	58,432,000	57,881,000
Water Pumping	8,687,000	8,333,000	8,292,000	8,310,000	8,330,000	8,368,000	7,853,000
Vehicle Fleet	26,847,000	28,114,000	26,809,000	28,584,000	28,416,000	27,861,000	28,472,000

The energy the City uses contributes to serving the public, businesses and visitors to London. London's population continues to grow, and growth presents a requirement to provide additional services. Energy usage per capita is a good measure to demonstrate the City's achievements in energy reductions while continued growth occurs in London.

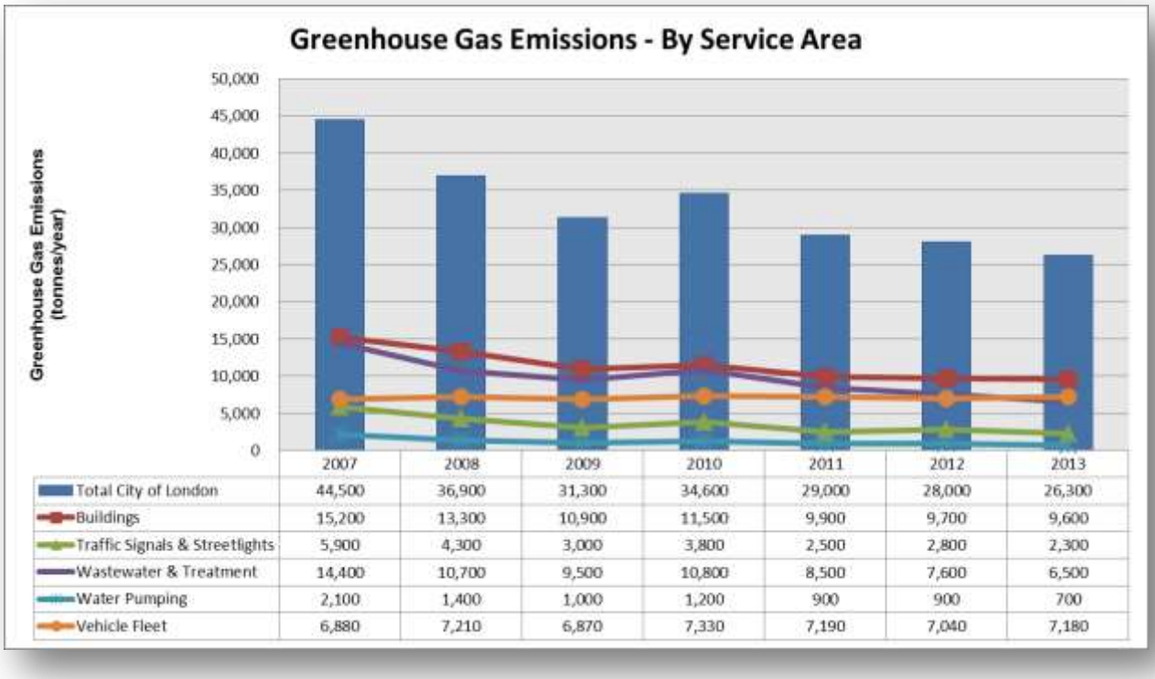
In terms of service delivery to Londoners, several years of data shows continued improvement of corporate energy use per capita with a 9.4 percent reduction compared to 2007. In 2013, the City of London's population has grown by almost 5 percent (17,000 people) compared to 2007 baseline records. In Figure 3 – Service Delivery to Londoners, the average energy consumption per person in 2013 based on London's population was 508 ekWh's.

Figure 3 - Service Delivery to Londoners

Energy Consumption (ekWh) by Service Area	2007	2013	Change since 2007 Variance	% Change
Buildings	73,225,000	68,778,000	(4,447,000)	-6.1%
Traffic Signals & Streetlights	24,762,000	25,980,000	1,218,000	4.9%
Wastewater & Treatment	65,594,000	57,881,000	(7,713,000)	-11.8%
Water Pumping	8,687,000	7,853,000	(834,000)	-9.6%
Vehicle Fleet	26,847,000	28,472,000	1,625,000	6.1%
Total City Of London	**199,115,000**	**188,964,000**	**(10,151,000)**	**-5.1%**
London's Population	**355,000**	**372,000**	**17,000**	**4.8%**
Energy Use (ekWh) per person	**561**	**508**	**(53)**	**-9.4%**

Greenhouse gas emissions from facility and infrastructure energy use are 6 percent lower (1,700 tonnes) between 2012 and 2013 and 41 percent lower (18,200 tonnes) in 2013 compared to 2007 due to increased conservation efforts and cleaner sources of energy used to generate electricity in Ontario (Figure 4).

Figure 4 - Greenhouse Gas Emissions



Provincial Annual Reporting Requirements

In August 2011, the provincial government introduced *Ontario Regulation 397/11* under the *Green Energy Act, 2009*. This regulation requires certain public agencies – Municipalities, Municipal Service Boards, Schools Boards, Universities, Colleges and Hospitals – to report on their energy consumption and associated greenhouse gas (GHG) emissions annually beginning in 2013.

Information on 2011 corporate energy use has already been provided to Council through the 2011 Corporate Energy Consumption Report to meet the previous requirements of the Green Energy Act. To meet the reporting requirements of the July 1, 2014 deadline, the City of London submitted the 2012 energy use and greenhouse gas emissions data to the Ontario Ministry of Energy based on the prescriptive template provided by the Ministry of Energy. The 2011 and 2012 Energy Consumption and Greenhouse Gas Emissions prescriptive reports are posted and available to download from the City of London's website.

The City of London is also required to prepare and post a CDM Plan as a guideline to encourage energy conservation and demand management activities by outlining a strategy for energy reduction targets and identifying future conservation potentials and measures.

Appendix B

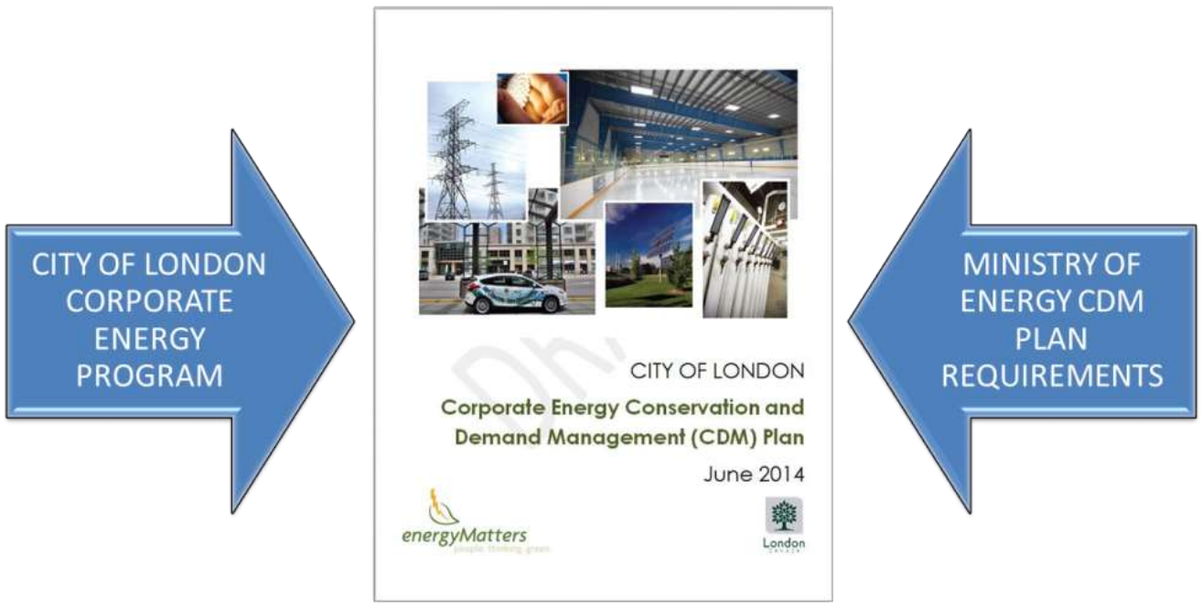
Corporate Energy Conservation and Demand Management (CDM) Plan

Background – Requirements for CDM Plan

City staff have prepared the CDM Plan to include the following minimum required elements:

- ✓ Information on the public agency's annual energy consumption during the last year for which complete information is available for a full year;
- ✓ The public agency's goals and objectives for conserving and otherwise reducing energy consumption and managing its demand for energy;
- ✓ The public agency's proposed measures under its CDM plan, the cost and saving estimates for these proposed measures and the estimated length of time these measures will be in place.
- ✓ A description of any renewable energy generation facility operated by the public agency and the amount of energy produced on an annual basis by the facility.
- ✓ Confirmation that the public agency's senior management has approved the CDM plan.

The City's Corporate Energy Management Program expanded upon in 2007 and the six key focus areas already underway contribute to a significant portion towards the required elements identified in the *Ontario Regulation 397/11* under the *Green Energy Act, 2009* for the CDM Plan.

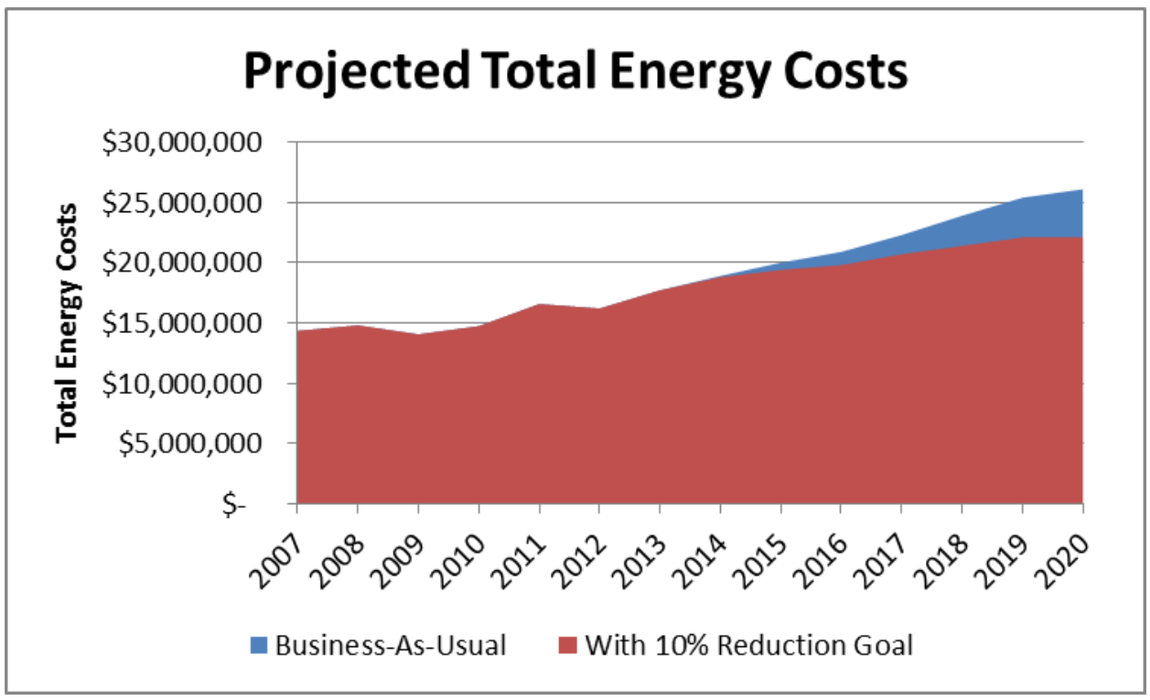


It is important to note that the Ministry of Energy only requires reporting on a select list of operations, excluding significant non-building energy uses such as street lighting and sports field lighting. This creates two separate sets of numbers for the City of London's corporate energy use – one for the Ministry of Energy, and another more-comprehensive report for Committee and Council.

10 Percent Reduction Target in Overall Energy Consumption (Baseline Year = 2014)

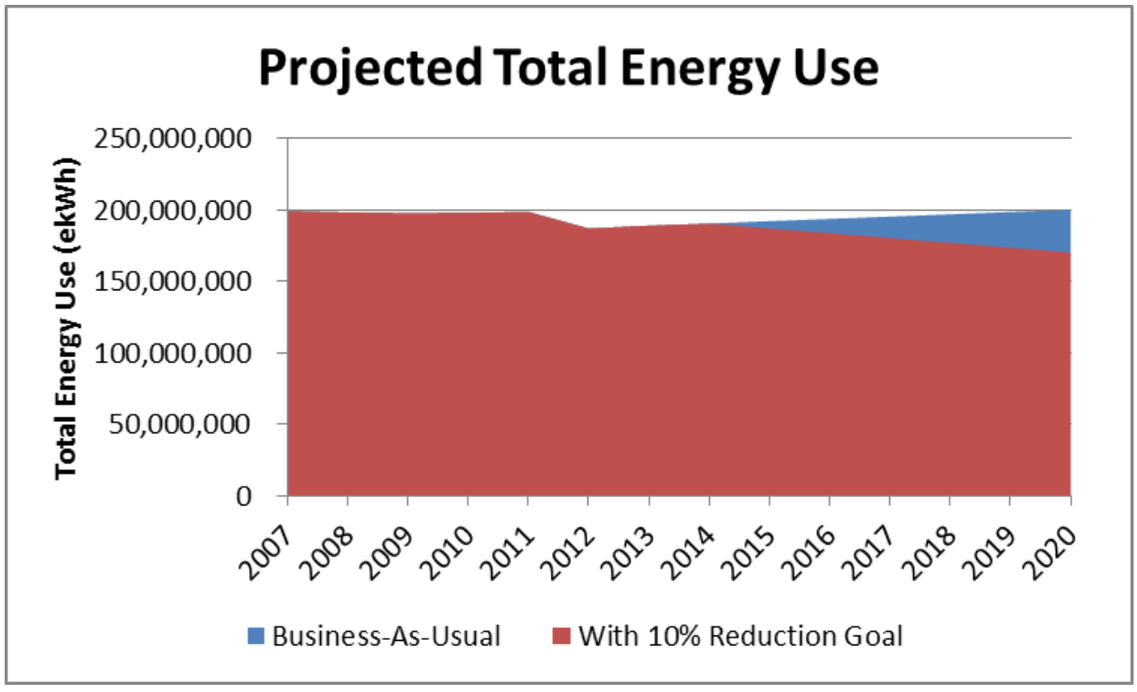
The significance of a 10 percent reduction in overall energy consumption compared to a business-as-usual approach (baseline year is 2014) is depicted on the next two pages for these four indicators:

1. Projected Total Energy Costs
2. Projected Total Energy Use
3. Projected Energy Efficiency
4. Projected Greenhouse Gas (GHG) Emissions



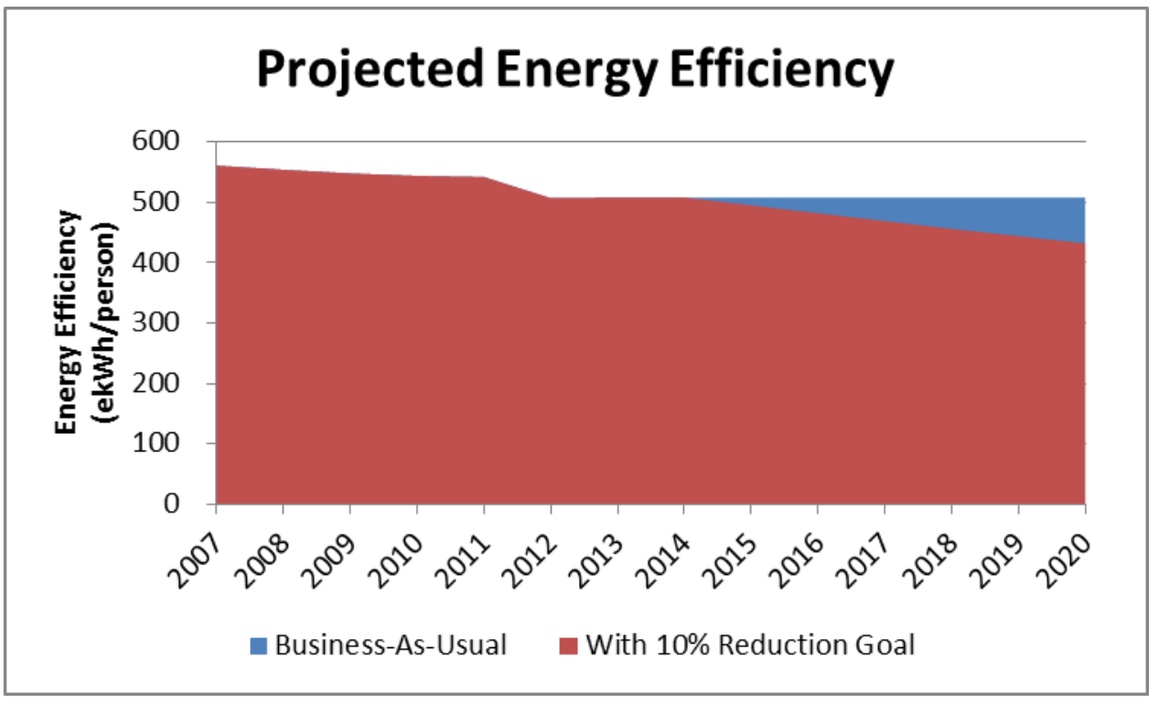
A projected energy cost avoidance of about $4 million per year by 2020.

	Business-As-Usual = $26,700,000
	10% Reduction in 2020 = $22,700,000
	Cost Avoidance = $4,000,000 per year



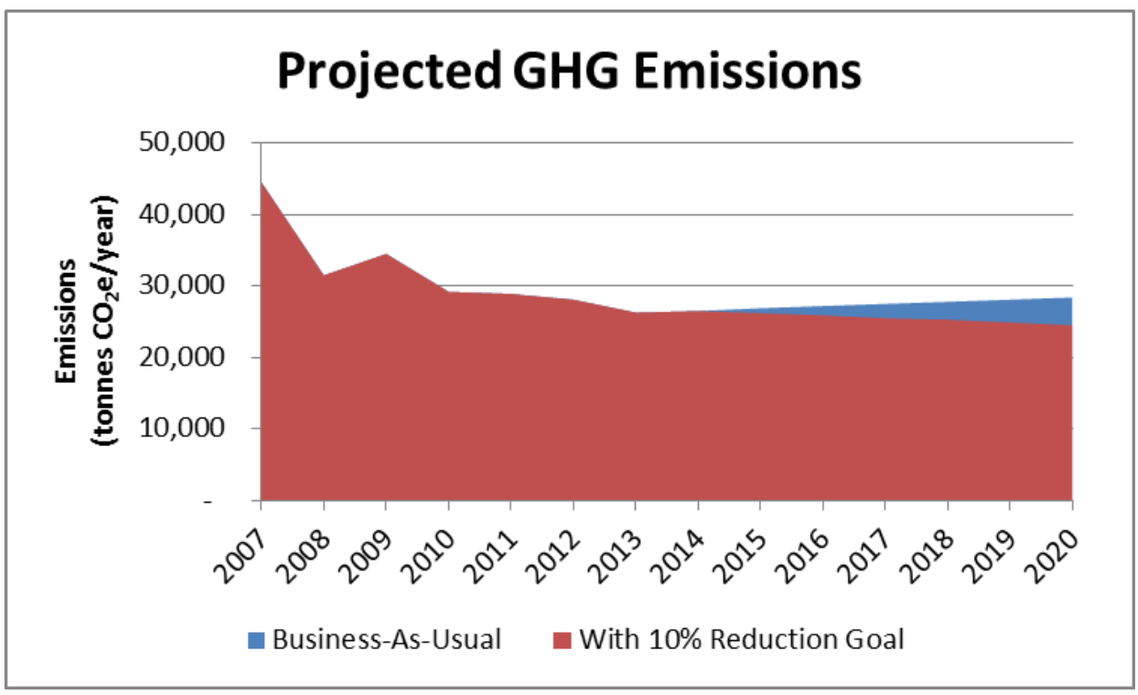
A projected total energy use reduction of 30 million ekWh per year by 2020.

	Business-As-Usual = 200,100,000 ekWh
	10% Reduction in 2020 = 170,074,000 ekWh
	Avoidance = 30,026,000 ekWh annually



A projected total energy efficiency of 76 ekWh/person annually based on the projected population in 2020.

	Business-As-Usual = 508 ekWh/person
	10% Reduction in 2020 = 432 ekWh/person
	Avoidance = 76 ekWh/person annually



A projected total GHG emission reduction of 3,900 tonnes annually by 2020.

	Business-As-Usual = 28,400 tonnes
	10% Reduction in 2020 = 24,500 tonnes
	Avoidance = 3,900 tonnes per year

Measures (Actions) Required to Achieve a 10 Percent Reduction

The City of London CDM plan proposes 35 measures (actions) that will be used towards the 10 percent reduction compared to 2014. Thirteen (13) actions have been selected to begin the process in 2014 and 2015. Results to these actions will be reported in 2015, and the future 22 actions will be confirmed based on the results and level of participation and adoption by the Corporation.

Proposed Outline of Measures (Actions) for 2014/2015 Corporate CDM Plan

The following is an overview of the 13 major actions identified in the Corporate Energy CDM Plan for the period 2014 and 2015 categorized under 4 areas as identified by the Ministry of Energy:

A. Tracking and Monitoring Actions
B. Technical Measures (Actions)
C. Organizational Measures (Actions)
D. Behavioral Measures (Actions)

A. Tracking and Monitoring Actions

The Plan identifies actions that continue to utilize the EnergyCAP software procured to provide the ability to track, record and analyze energy consumptions including:

1. Continue to provide the required data to support the requirements outlined in Ontario Regulation 397/11 under the Green Energy Act, 2009.

2. Monitor our energy consumption and accounts to ensure accuracy and consistency of usage by identifying metering or consumption errors.

3. Identify opportunities to forecast energy consumption and costs, with the data utilized during the budget process in future capital and maintenance projects to be completed in 2014/15.

B. Technical Measures (Actions)

The following technical measures (actions) have been identified:

4. Focus on city facilities and buildings that will provide the greatest opportunities in energy saving measures by utilizing the Ameresco report to complete projects identified in the replacement date of 2014/15.

5. Utilize of incentive opportunities from governmental, and local distribution companies towards energy audits on capital projects.

6. Consult with city staff and managers who operate the buildings, systems and equipment to review and suggest energy saving opportunities.

7. Invest in future energy audits towards identifying new energy saving measures and opportunities on City of London infrastructure

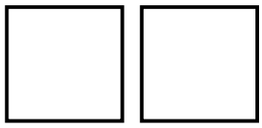
C. Organizational Measures (Actions)

The following organizational measures (actions) have been identified:

8. Continue to work with energy market advisors to obtain procurement advice to evaluate utility rates on behalf of the City's commodity supply arrangements to optimize rates favourable to the City of London.

9. Develop a policy that all retrofits to infrastructure consisting of energy measures be reviewed for energy conservation practices.

10. Develop a policy to adapt a minimum standard of equipment for energy appliances, and high efficiency motors.



11. Invest in future energy audits towards identifying new energy saving measures and opportunities on City of London infrastructure.

D. Behavioural Measures (Actions)

In the CDM program in 2014/15 the City of London will focus on the following highest priority actions to support the City of London CDM program. The program will:

12. Continue to build upon the “It’s Within Reach” Program to encourage employee engagement towards energy conservation in the workplace.

13. Continue to develop and improve upon the employee engagement program to solicit energy saving ideas from City of London Staff

Proposed Outline of Measures (Actions) for the Corporate CDM Plan to 2016 to 2019

The following is an overview of the additional 22 measures (actions) identified in the CDM Plan for the period 2016 to 2019 using the same 4 categories:

A. Tracking and Monitoring Actions
B. Technical Measures (Actions)
C. Organizational Measures (Actions)
D. Behavioral measures (Actions)

A. Tracking and Monitoring Actions

14. Continue to meet the annual reporting requirements identified in Ontario Regulation 397/11 to support the required update to the CDM plan in 2019.

15. Continue to identify opportunities in energy efficiencies within Corporate Facilities, operations and infrastructure.

16. Monitor and verify actual energy consumption, cost reductions and projected savings from energy conservation projects.

17. Assist with energy budgeting and accruals to report on and forecast energy consumption and costs for budget process.

18. Review real-time tracking and monitoring options available to incorporate real-time monitoring of all utilities to better support energy used by the City of London. In order to accurately measure the success of energy efficiencies implemented to corporate facilities, the addition of real-time metering would support the targeted measures to be monitored to see the positive effects.

19. Include a strategy or policy to better capture energy usage and data for measurement in all City of London building retrofits for better measurement. Moving towards interval meters on all electrical services and pulse outputs on gas and water meters would support this initiative to better track energy use at City of London facilities.

B. Technical Measures (Actions)

20. Focus on city facilities and buildings that will provide the greatest opportunities in energy saving measures by utilizing the Ameresco report to complete projects identified in the replacement date to 2020.

21. Continue to identify opportunities in energy efficiencies within Corporate Facilities, operations and infrastructure and utilize incentive opportunities from government and local distribution companies.

22. Develop and implement a master specification for direct digital controls to be used as the basis of design for building automation system projects.

23. Review and evaluation various mechanical equipment for potential cost recovery.

24. Develop a policy that all major renovations and new construction of city owned facilities include provisions to include central BAS control technology.

25. Continue to develop and review opportunities towards the development of renewable energy generation projects.

C. Organizational Measures (Actions)

26. Piloting the use of tools such as Natural Resource Canada's Portfolio Manager and the Building Owners and Managers Association Canada's Building Environmental Standards (BOMA Best) performance labelling system at City Hall.

27. A continuing focus on energy procurement by working with energy market advisors to obtain procurement advice for electricity and natural gas commodities.

28. Developing a policy that all new City of London owned buildings be designed to meet or exceed LEED Silver standards.

29. Continuing evaluation of utility rates on behalf of the City's commodity supply arrangements to optimize rates favorable to the City.

D. Behavioural Measures (Actions)

30. Reporting structure for staff to report repairs that influence energy savings.

31. Continuing to identify opportunities in energy efficiencies within Corporate Facilities, operations and infrastructure and utilize incentive opportunities from government and local distribution companies.

32. Developing and implementing a master specification for direct digital controls to be used as the basis of design for building automation system projects.

33. Ongoing review and evaluation of various mechanical equipment for potential cost recovery.

34. Developing a policy that all major renovations and new construction of city owned facilities include provisions to include central BAS control technology.

35. Continuing to develop and review opportunities towards the development of renewable energy generation projects.