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:	**COMMUNITY ENERGY ACTION PROGRAM**

RECOMMENDATION

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

a) The final Community Energy Action Plan **BE APPROVED** for use as guidance document for activities over the next five years as part of a new Community Energy Action Program; it being noted that the final plan is supported by the companion documents provided to Municipal Council in December 2013:
- Understanding the Data
- Learning from People; and
- Reporting on Progress;

b) The 2014/15 Community Energy Actions **BE APPROVED** as part of a new Community Energy Action Program, and City staff **BE DIRECTED** to prepare an implementation plan for the various activities for Fall 2014.

c) The 2013 Community Energy & Greenhouse Gas Inventory report **BE RECEIVED** for information.

d) The attached proposed By-law (Appendix D) **BE INTRODUCED** at the Municipal Council Meeting of July 29, 2014 to amend the Grant Agreement for GMF 10311 from the Federation of Canadian Municipalities Green Municipal Fund to change the plan completion date and second grant contribution date.

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)
- 2012 Community Energy and Greenhouse Gas Inventory: Challenges and Opportunities (October 28, 2013 meeting of the Civic Works Committee, Agenda Item #8)
- Update – Key Energy Stakeholder Engagement – Community Energy Action Plan (July 22, 2013 meeting of the Civic Works Committee, Agenda Item #16)

BACKGROUND

PURPOSE AND REPORT HIGHLIGHTS:

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

- An overview of the feedback provided by key energy stakeholders on the draft Community Energy Action Plan (CEAP) and public input received via Reduce Impact London;
- A copy of the final CEAP;
- An overview of economic development and business opportunities in energy conservation and sustainable energy associated with the CEAP
- A description on how the CEAP will be implemented through the new Community Energy Action Program; and
- An overview of the updated 2013 Community Energy and Greenhouse Gas Inventory.

REPORT HIGHLIGHTS

Part A: Community Energy Action Plan (CEAP)

- 28 key energy stakeholders provided input into the CEAP.
- The overall goals of the CEAP and the Community Energy Action Program are to:
    - Increase the local economic benefit of sustainable energy use through cost savings from energy conservation and energy efficiency, revenue from local production of clean & green energy products, and job creation associated with product and service providers engaged in these activities; noting that in 2013 $1.5 billion was spent in London on energy consumption.
    - Reduce the environmental impact associated with energy use, through the use of greenhouse gas emission (GHG) reduction targets consistent with the Province of Ontario's goals, namely:
        - 15 percent reduction from 1990 levels by 2020, and
        - 80 percent reduction from 1990 levels by 2050.
- The CEAP outlines the actions to be taken by the City of London and many of London's key energy stakeholders over the next five years.
- If London continues to use energy at 'business-as-usual' levels (i.e., identified as the 2010 rate of energy use per person), total energy costs could reach over $1.9 billion by 2018. By implementing the CEAP, total energy costs for London could be over $250 million per year lower by 2018 compared with the 'business-as-usual' scenario.

Part B: From CEAP to Community Energy Action Program

- The City of London is proposing 40 key City-led actions for 2014 and 2015.
- These proposed actions will form the basis for an implementation plan which will be used to shift the CEAP into a Community Energy Action Program.
- This implementation plan will be led by existing Environmental Programs staff and program funding and will draw upon existing resources across the Corporation performing work that aligns directly or indirectly with energy conservation requiring no new funds for 2014 or 2015.

Part C: 2013 Community Energy and Greenhouse Gas Emissions Inventory

- London as a whole consumed approximately 57,000 terajoules of energy in 2013, 14 percent above 1990 levels, but two percent below 2007, the year where energy use and greenhouse gas emissions in London reached their peak.
- On a per person basis, Londoners and London businesses used seven percent less energy in 2013 than used in 2007.
- London as a community spent approximately $1.5 billion on energy in 2013, an increase of seven percent from 2012, mainly due to higher gasoline use and higher electricity prices.
- Had London used energy at 'business-as-usual' levels (i.e., 2010 – the first year for which total energy cost data is available), total energy costs in 2013 would have been almost $70 million higher (i.e., an additional expenditure of $70 million has been avoided).
- London as a whole released approximately 3.1 million tonnes of GHG emissions in 2013, seven percent below 1990 levels, and 18 percent below peak levels seen in 2007.
- On a per person basis, Londoners and London businesses released 22 percent fewer GHG emissions in 2013 than they did in 2007, along with reductions in air pollution emissions.

Part D: Federation of Canadian Municipalities (FCM) Green Municipal Fund

- The City of London will be receiving the second and final $25,000 grant from the Green Municipal Fund upon Council approval of the CEAP.

CONTEXT:

The City of London does not have direct control over how much energy is used in London, but it does have influence. The control over energy use in London rests primarily with our citizens, visitors, employers and employees. Individual and collective action with respect of sustainable energy use, energy management, and energy conservation is key to our future.

London's efforts on energy conservation, air quality and greenhouse gas generation can be traced back as far as its Vision '96 - Planning for Tomorrow activities and more recently to its 2003 Air Quality in London - Moving Forward Locally air quality plan. This latter strategy was part of a broader environmental program encompassing all areas of sustainability, and is encapsulated in the City's 2011-2014 Strategic Plan. The strategy is complemented by Rethink Energy London, a framework that supported community and corporate energy initiatives.

Rethink Energy London was a community engagement and action plan initiative that started in January 2010 to increase public awareness, encourage stakeholder action, and seek input on sustainable energy and greenhouse gas (GHG) emission mitigation actions that also creates local social and economic benefits. The Federation of Canadian Municipalities' Green Municipal Fund provided $50,000 to help fund two of the key activities undertaken under Rethink Energy London – the Integrated Energy Mapping for Ontario Communities (IEMOC) energy mapping initiative and London's Roundtable on the Environment and the Economy. Half of this funding was received upon completion of the IEMOC project, with the remaining half to be received after Council's approval of the Community Energy Action Plan.

The City of London is also a participant in the Federation of Canadian Municipalities' Partners for Climate Protection program, and London achieved Milestone 5 status (the highest milestone level) in 2013.

ReThink London was launched in 2012 and is a comprehensive land use planning and city visioning initiative to help obtain Londoners' thoughts on how we can do a better job through urban planning. Urban planning can have a significant impact on how much energy we use. Under the new, draft London Plan, designing new communities with a mix of land uses and density reduces the need to drive all the time, and can allow for innovative energy-saving technologies that take advantage of the different heating and cooling needs of these buildings. Infill development projects, growing "inwards and upwards" particularly in older, car-dependent suburban neighbourhoods, can help "retrofit" these neighbourhoods to have these same benefits.

The 2030 Transportation Master Plan and the associated Comprehensive Active Transportation (AT) and Transportation Demand Management (TDM) Action Plan will help further shift this commuter travel and travel at all times of the day toward more sustainable choices.

Climate change adaptation measures are those taken to help London cope with the forecast increase in extreme weather events that will accompany the long term trend towards a warmer climate for London. Measures that accomplish both mitigation (GHG emission reductions) and adaptation for climate change are considered highly desirable as they provide the most effective response to climate change. Examples of this include district energy systems that provide energy security during extreme weather events as well as energy-efficiency benefits. A multi-disciplinary team of City staff are currently developing strategies for climate change adaptation for London.

The Corporation of the City of London is also one of London's largest employers, operating over 200 facilities and over 300 vehicles involved in delivering a wide range of services to Londoners. The City of London is expected to lead-by-example, and the City's Corporate Energy Management Plan outlines how to accomplish this.

DISCUSSION:

Part A: Community Energy Action Plan (CEAP)

Why is the City of London Involved in Energy Planning?

Over the last ten years, the City of London has been interested in energy use in London primarily for environmental reasons, namely that Londoners' contribution to both smog-forming emissions and greenhouse gas emissions come primarily from fossil fuel energy use.

With rising energy prices for petroleum fuels and electricity, Londoners are starting to become aware of the financial cost of using energy as well. Rising energy prices are now starting to provide greater financial incentives to reduce energy use. As noted in the 2013 Community Energy and Greenhouse Gas Inventory, approximately $1.5 billion was spent on energy in 2013. London would be better off keeping more of its money in the local economy. Every one percent reduction in energy use that Londoners and London businesses achieve now keeps about $12 million from leaving our local economy.

As noted above, the new London Plan will help encourage new growth "inwards and upwards" that will reduce Londoner's dependency on personal vehicles to move around. However, we cannot rely on this new growth alone to reduce energy use and associated emissions. The greatest impact will be made by fixing what has already been built.

One of the most critical roles that the City plays is to "connect the dots" between all of our local initiatives with all of London's major community stakeholders, the activities they engage in, and the role that these stakeholders can play in the Community Energy Action Program.

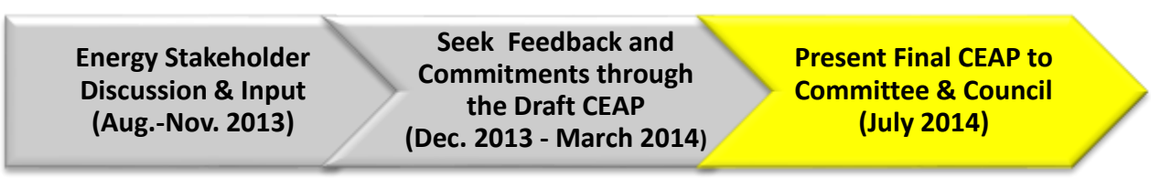
Energy Stakeholder Discussion & Input

In the summer of 2013, a customized Discussion Primer was prepared and submitted to various organizations that we identified as Key Energy Stakeholders. The feedback that was received from the Discussion Primer was incorporated in to the draft Community Energy Action Plan, which was then recirculated back to these Key Energy Stakeholders for final input.

Combined, comments have been received from the following:

- 3M Canada
- Advisory Committee on the Environment
- Argyle Business Improvement Association
- Building Owners' Management Association (BOMA) Ontario
- Fanshawe College
- First Capital Realty
- Labatt Brewery
- London & St. Thomas Association of Realtors
- London Chamber of Commerce
- London Development Institute
- London Economic Development Corp.
- London Health Sciences Centre
- London Home Builders' Association
- London Hydro
- London Middlesex Housing Corporation
- London Police Services
- London Property Management Association
- London Public Library
- London Transit Commission
- Mayor's Sustainable Energy Council
- Middlesex-London Health Unit
- Museum London
- Ontario Power Authority
- ReForest London
- TD-Canada Trust
- Union Gas
- Upper Thames River Conservation Authority
- Western University

These stakeholders expressed support for the CEAP in principle, and most stakeholders provided feedback and recommendations on the proposed actions, as well as provided information on their own actions. This information has been incorporated into the CEAP.



Community Energy Action Plan and Companion Documents

London's CEAP builds upon what City staff learned through Rethink Energy London activities. It sets out an action plan with the following key principles:

1. This needs to be the Community's plan for London, not the City of London's plan for the community.
2. We can't control the price of energy, but we can control the cost of energy.
3. Start first with conservation.
4. Get the function and size right.
5. Invest in energy efficiency and good design.

6. Make use of free heat and free light.
7. Reduce waste.
8. Make it local.
9. Build on local strengths.
10. Use renewable energy.
11. Measure your progress.
12. Share your stories.

The CEAP focusses on actions to be taken in the immediate future (2014/15) and over the duration of the next Council term (2015-2018) as part of the Community Energy Action Program outlined in Part B of this report. The overall goals are to:

1. Increase the local economic benefit of sustainable energy use through:
   a. Cost savings from energy conservation and energy efficiency,
   b. Revenue from local production of clean & green energy products, and
   c. Job creation associated with product and service providers engaged in these activities.

2. Reduce the environmental impact associated with energy use, through the use of greenhouse gas emission (GHG) reduction targets consistent with the Province of Ontario's goals, namely:
   a. 6 percent reduction in total GHG emissions from 1990 levels by 2014,
   b. 15 percent reduction from 1990 levels by 2020, and
   c. 80 percent reduction from 1990 levels by 2050.

In addition, there are specific goals (measureable or aspirational) established for each energy-using sector in London:

- Single-Family Homes
- Multi-Unit Residential Buildings
- Commercial and Institutional Buildings
- Industry and Manufacturing
- Stores and Restaurants
- Local Energy Production and Cogeneration of Heat and Power
- Vehicles and the Transportation System

The three most common benchmarks being used for reporting on overall progress are:

- 1990 – the baseline year used for the Province of Ontario's GHG reduction targets
- 2007 – the year energy use and greenhouse gas emissions reached their peak in London
- 2010 – the first year for which total energy cost data has been determined

Depending upon the available data, other baseline years may be used for reporting progress on sector-specific goals.

The three companion documents introduced in December 2013 with the draft CEAP are still applicable:

1. Understanding the Data - summarizes the majority of the information that City staff have regarding energy use in London and the associated environmental issues.

2. Learning from People - summarizes the information that City staff have regarding what Londoners and key energy stakeholders in London think we should do on the topic of sustainable energy.

3. Reporting on Progress - document is to outline how City staff will keep Council and Londoners informed on the progress being made on London's CEAP.

<u>Additional Community Engagement</u>

Since the release of the draft CEAP in December 2013, new tools have been prepared and used to engage Londoners. The Trouble With Bubbles GHG visualization video has proven to be a popular awareness-raising tool at public events, the CityGreen display, and on-line through the City of London's YouTube EnviroClips where it has had 1,385 unique viewers as of July 2, 2014.

Reduce Impact London is a new web initiative, launched in late January 2014, to help Londoners and London's businesses and institutions share their energy conservation and other environmental stories. Some Londoners have also used this to share ideas on what further actions should be taken. As of July 2, 2014, there have been 118 actions posted and 186 users registered for the website.

City staff also worked with local environmental blog, Sustainable Joes, to produce two short educational Energy Myths videos. The idling myth video, released early February, has had 1,100 unique views, and the thermostat myth video, released in March, has had 471 unique views.

Economic Development and Business Opportunities in Community Energy Conservation and Sustainable Energy Projects

Money saved through energy efficiency and conservation can be used for other purposes, whether that's paying down debts faster or purchasing other goods and services. Investing in energy saving retrofits, local sustainable energy projects, and local energy production creates local jobs. The CleanTech Sector, which includes energy conservation and sustainable energy product and service providers, is a key focus area for the London Economic Development Corporation (LEDC).

If London continues to use energy at 'business-as-usual' levels (i.e., identified as the 2010 rate of energy use per person), total energy costs could reach over $1.9 billion by 2018. By implementing the CEAP, total energy costs for London could be over $250 million per year lower by 2018 compared with the 'business-as-usual' scenario.

Appendix A provides an overview of the economic benefits associated with taking action to reduce energy use.

Health Benefits Provided by the CEAP

As noted earlier, using and burning fossil fuels emits smog-forming air pollutants. This includes nitrogen oxides from fuel combustion in vehicles and stationary sources like furnaces and generators, as well as volatile organic compounds (VOCs such as gasoline fumes). Reducing energy use reduces these emissions, including indirect emissions associated with electricity use during peak demand periods.

Active transportation – walking and cycling – increases physical activity and fitness levels while reducing gasoline use.

Improving the energy efficiency of older buildings can help deal with issues like mould caused by moisture infiltration into homes and buildings. New buildings and major renovations undertaken with "green building" principles like natural lighting, passive heating, improved ventilation, and low VOC materials have proven to be effective at reducing workplace absenteeism.

Challenges to Implementation of the CEAP

There are a number of external factors that can influence, positively and negatively, progress on the CEAP here in London:

- Energy commodity prices, which are influenced by both global and national/provincial events
- Federal and provincial climate change and/or energy policy
- Regional, national, and global economic conditions, which can influence the factors above
- Disruptive technological developments directly or indirectly related to energy use
- Societal changes that alter broad public opinion on issues like energy and climate change

This is why it is important for London's CEAP to be a "living document", in that the actions taken by the City of London and key energy stakeholders are expected to change over time.

Part B: From CEAP to Community Energy Action Program

The pace of local action can be influenced by both the levels of funding and resources provided, as well as by more-efficient and collaborative application of resources between the City of London and key energy stakeholders (business and community).

For the City of London, this involves taking the actions outlined in the CEAP and developing this into an ongoing Community Energy Action Program that is frequently updated and with results reported on a semi or annual basis. The proposed list of 2014/15 Community Energy Actions for the City of London is provided in Appendix B is a key part of that step of moving from plan to program. In total, there are 40 proposed City-led actions to be undertaken that have their roots in the CEAP.

No new funds will be required in 2014 and 2015, as these proposed actions will make use of existing Environmental Programs staff and program funding and will draw upon existing resources across the Corporation performing work that aligns directly or indirectly with energy conservation. In addition to City staff time, funding allocated to energy-related, community-led actions, awareness, and education will be similar to recent years, where it was ranged between $50,000 and $75,000.

Additional details on the implementation of the Community Energy Action Program, such as resource needs, timelines, key partners, and reporting on progress, will be provided in Fall 2014.

The following table outlines some of the major activities planned (tentative) for Fall/Winter 2014 where the program will be rolled out to a larger audience:

Potential Funding and Collaboration Opportunities – identify and examine opportunities for potential funding and collaborations from provincial and federal government levels, other municipalities, utilities, businesses, other funding agencies and groups	August – October, 2014
Energy Connections - The release of an overview report to the community highlighting the Community Energy Action Program and ways for individuals, groups, employees and employers to get engaged	September 2014
Energy Connections - Video Speakers Series and Outreach Collaborations	Fall/Winter 2014
Compressed Natural Gas Workshop for Local Fleet Managers	Fall 2014
Commercial Building Sector Energy Management Workshop	Fall 2014
LHBA Lifestyles Home Show	January 30 – February. 1, 2015
FCM Sustainable Communities Conference	February 10-12, 2015

Part C: 2013 Community Energy and Greenhouse Gas Inventory

The *2013 Community Energy and Greenhouse Gas Inventory* is an update on the *2012 Community Energy & Greenhouse Gas Inventory: Challenges & Opportunities* report that provides an overview of the energy used in the London community as a whole.

This report covers all significant energy sources used in London: natural gas, gasoline, electricity, diesel, fuel oil, and propane. Sectors covered by the inventory include road transportation, residential, industrial, commercial, and institutional. It also includes an estimate of the total cost associated with these energy needs and the greenhouse gas emissions associated with these energy sources. In addition, this report also includes the greenhouse gas emissions associated with the City of London's W12A landfill and closed landfill sites.

Appendix C provides an overview of the inventory's results.

Part D: Federation of Canadian Municipalities Green Municipal Fund

As noted earlier, the Federation of Canadian Municipalities' Green Municipal Fund provided $50,000 to help fund two of the key activities undertaken under Rethink Energy London – the *Integrated Energy Mapping for Ontario Communities (IEMOC)* energy mapping initiative and

London's Roundtable on the Environment and the Economy. Half of this funding was received upon completion of the IEMOC project, with the remaining half to be received after Council's approval of the CEAP.

In order to submit our final funding request, an amendment needs to be made to the existing funding agreement to change the dates for plan completion and final request for disbursements. The proposed by-law to authorize this amendment is provided in Appendix D.

PREPARED BY:
JAMIE SKIMMING, P. ENG. **MANAGER, AIR QUALITY**

PREPARED AND RECOMMENDED BY:	**REVIEWED & CONCURRED BY:**
JAY STANFORD, M.A., M.P.A. **DIRECTOR, ENVIRONMENT, FLEET & SOLID WASTE**	**JOHN BRAAM, P.ENG.** **MANAGING DIRECTOR, ENVIRONMENTAL & ENGINEERING SERVICES & CITY ENGINEER**

Appendix A Summary of Economic Development and Business Opportunities in Community Energy Conservation and Sustainable Energy Projects

Appendix B Proposed 2014/15 City of London Actions as Part of the Community Energy Action Program

Appendix C Summary of 2013 Community Energy and Greenhouse Gas Inventory

Appendix D Proposed By-Law to amend the Grant Agreement for GMF 10311 with the Federation of Canadian Municipalities Green Municipal Fund

Documents found on the City of London website (www.london.ca) are:
Community Energy Action Plan
Understanding the Data
Learning from People
Reporting on Progress
2013 Community Energy and Greenhouse Gas Inventory

c John Fleming, Managing Director, Planning and City Planner
George Kotsifas, Managing Director, Development & Compliance Services & Chief Building Official
Lynne Livingston, Managing Director, Neighbourhood, Children & Fire Services
Kapil Lakhotia, General Manager, London Economic Development Corporation
Vinay Sharma, CEO, London Hydro
Ed Seaward, Manager, Market Opportunity Development, Union Gas
All remaining participating key energy stakeholders

APPENDIX A

SUMMARY OF ECONOMIC DEVELOPMENT AND BUSINESS OPPORTUNITIES IN COMMUNITY ENERGY CONSERVATION & SUSTAINABLE ENERGY PROJECTS

As noted in the 2013 Community Energy and Greenhouse Gas Inventory, approximately $1.5 billion was spent on energy in 2013. Every one percent reduction in energy use that Londoners and London businesses achieve now keeps about $12 million from leaving our economy. Money saved through energy efficiency and conservation can be used for other purposes, whether that's paying down debts faster or purchasing other goods and services. Investing in energy saving retrofits, local sustainable energy projects, and local energy production creates local jobs. Examples of the above include:

- Energy retrofits of buildings are primarily carried out by London area contractors and service providers, and can also generate demand for London area suppliers of energy saving products.
- Green building projects, such as Leadership in Energy and Environmental Design (LEED) Certified buildings and Energy Star New Homes, provide opportunities for London area businesses to increase their capacity to deliver these products and services.
- Purchasing new fuel efficient vehicles, hybrid vehicles, and electric vehicles helps to reduce emissions and support the local and regional economy.
- Replacing older appliances with new, energy efficient (Energy Star) appliances also helps to reduce energy use and supports the local and regional economy.
- Increasing the local capacity for electricity generation helps keep electricity related expenditures in London, as well as builds local capacity to develop these projects.

The CleanTech Sector, which includes energy conservation and sustainable energy product and service providers, is a key focus area for the London Economic Development Corporation.

As part of the work under the *Integrated Energy Mapping for Ontario Communities* project, the Canadian Urban Institute developed a complex spreadsheet model of London's current (2008) and future (2030) transportation and buildings energy use. Details on the model's assumption can be found in the Integrated Energy Mapping for Ontario Communities report and appendices.

Estimated Cost Avoidance and Environmental Benefits for Transportation Scenarios

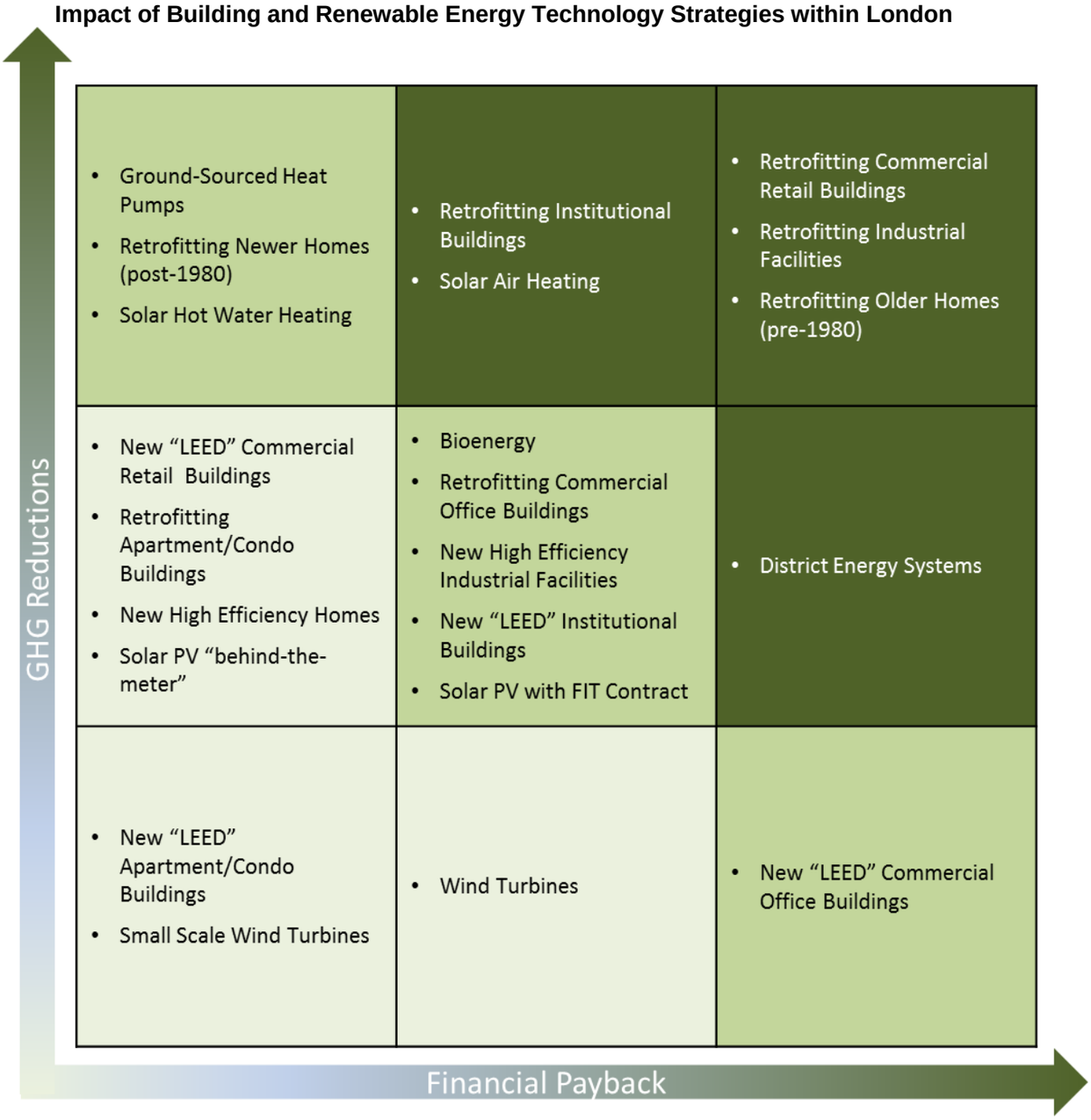
For transportation, the future cost-effectiveness of various transportation strategies could not be assessed, as the personal choice to purchase smaller, fuel-efficient vehicles and/or to walk or bike more often actually save money right away. However, the report authors were able to estimate future energy costs and energy savings associated with various strategies. The results are summarized below.

	Transportation Energy & GHG Reduction Scenarios		
	Business As Usual	**High-Efficiency Improvements**	**Ultrahigh-Efficiency Improvements**
Transit trips	10% of trips	15% of trips	20% of trips
Walking & cycling trips	9% of trips	11% of trips	13% of trips
Vehicle fuel efficiency	Same as 2010	25% improvement	50% improvement
Number of trips	Same as 2010	5% decrease	10% decrease
Length of trips	Same as 2010	5% decrease	10% decrease
Annual fuel cost by 2030	$1.4 billion ($700 million higher than 2013)	$900 million ($500 million avoided)	$600 million ($800 million avoided)
Change in GHG emissions by 2030	up 160,000 tonnes/year	down 260,000 tonnes/year	down 520,000 tonnes/year

Estimated Financial and Environmental Cost/Benefits for Buildings and Renewable Energy Technologies

For building energy use and renewable energy technology, the Canadian Urban Institute assessed the costs and impact of a wide range of green building, building retrofit, and renewable energy strategies on future energy costs, greenhouse gas emissions, and job creation. The following illustration summarizes the potential economic payback and environmental benefits for London as a whole for various sector- or technology-focussed strategies. All of these strategies are important for London to undertake, and individual projects can have unique circumstances that result in higher impacts and faster payback for the project proponent. What this illustration does is to help identify, at a high level, the relative impact these strategies have for London's total energy use and associated greenhouse gas emissions.

Impact of Building and Renewable Energy Technology Strategies within London



The current low costs for natural gas, used for space heating and water heating, slows down the payback rate for some of these actions. However, this does increase the payback rate for strategies like the cogeneration of heat and power. Ontario's relatively-clean electricity grid, with over 80 percent of generation coming from emissions-free sources, means that electricity-savings measures can provide good payback, but not as much emissions-reduction benefit as those measures that reduce natural gas use.

Ontario's new Building Code, which incorporates many energy-efficiency measures from

programs like Energy Star® New Homes, also sets a high bar for those home builders who want to build above and beyond what the code asks for. Individual high-efficiency new buildings by themselves can have significantly lower energy costs and environmental impacts, but London has many more, older buildings that would benefit from energy retrofits.

The Canadian Urban Institute's energy model also estimates the project value, jobs created, revenues generated, and energy cost savings associated with these sector- or technology-focussed strategies.

Scenario 1 is a "payback" scenario that assumes:

- The Feed-In Tariff remains in place, and that solar PV and bioenergy opportunities in London are maximized – almost 1000 megawatts in total - by 2030.
- Retrofits for existing industrial buildings & processes, commercial retail buildings, and commercial office buildings;
- High efficiency construction for new commercial office buildings and new industrial buildings & processes; and
- Expanded use of district energy.

Scenario 2 is a "break-even" scenario that assumes that the province meets most of its renewable electricity procurement goals elsewhere in Ontario, or that the Feed-In Tariff is no longer available as an incentive for local renewable electricity generation. In this scenario, energy savings and emission reductions by 2030 are achieved through:

- Retrofits for existing commercial office buildings, commercial retail buildings, industrial buildings & processes, and institutional buildings; and
- High efficiency construction for new commercial office buildings, new industrial buildings & processes, and new institutional (schools, hospitals, and government) buildings.

Scenario 3 is a "maximum reduction" scenario that assumes that all the measures outlined in the energy model are undertaken by 2030. This does not mean that every single building is retrofitted to be a net-zero energy building. The model assumed that there are limits to the extent to which older buildings can be retrofitted without requiring major renovation, and that there are also limits to the number of buildings that could accommodate technologies such as ground-sourced heat pumps and solar hot water heaters.

	Building and Technology Energy & GHG Reduction Scenarios		
	Scenario 1 Actions with payback (6% return or better)	**Scenario 2 Actions that have payback or breakeven without subsidies**	**Scenario 3 Maximum reduction of consumption of fossil fuels**
Local Investment over 20 years	$6.6 billion ($330 million/year)	$1.5 billion ($75 million/year)	$9.5 billion ($480 million/year)
Full-time jobs created	3,300	760	4,600
FIT revenue by 2030	$520 million/year	assumes no FIT program	$540 million/year
Energy costs avoided by 2030	$180 million/year	$210 million/year	$330 million/year
GHG reductions by 2030	400,000 tonnes/year	480,000 tonnes/year	1,100,000 tonnes/year

Although some of this financial and employment benefit will flow to product and service providers outside London, increasing the demand for energy-related projects in London will help local product and service providers.

APPENDIX B
PROPOSED 2014/15 CITY OF LONDON ACTIONS AS PART OF THE COMMUNITY ENERGY ACTION PROGRAM

POLICY SUPPORT FOR COMMUNITY ENERGY ACTION PLANNING

1. Incorporate the defining principles of London's Community Energy Action Plan and Program into the new London Plan.

2. Incorporate in to the London Plan means to encourage new homes and buildings to be "future-ready" through low-cost design principles (e.g., provide conduits) that can accommodate the future installation of electric vehicle charging systems (i.e., "EV-ready"), solar energy systems (i.e., "solar-ready") and district thermal energy loops (i.e., "DE-ready").

3. Incorporate in to the London Plan means to encourage in-fill development in areas served by existing district energy systems to voluntarily connect to the system.

4. Incorporate in to the London Plan requirements for greenfield industrial, commercial, and high-density residential land development to reserve "utility right-of-ways" to accommodate the future use of district energy systems.

5. Study the implementation of Local Improvement Charges for residential and commercial building energy and water retrofits in other jurisdictions, such as the pilot program implementation of the *Home Energy Loan Program* launched in the City of Toronto in 2014.

6. Work with the development industry on an integrated community energy solutions pilot project, of sufficient size, to evaluate current practices (municipal and developer); to identify potential barriers in new developments, and to begin the process of overcoming these barriers for the future development in London. Alternatively, carry out a detailed analysis of a comparable project(s) in another Ontario or Canadian jurisdiction.

7. Advocate for increased support from federal and provincial governments for undertaking community energy planning at the municipal level of government.

8. Participate as an observer the Ontario Power Authority's (OPA's) regional electricity planning activities for the London area in 2015.

REPORTING AND EDUCATION ABOUT THE ECONOMIC AND ENVIRONMENTAL CONSIDERATIONS OF ENERGY USE

9. Identify "influencers" in the community, such as individuals in businesses, organizations, neighbourhoods, and schools at all levels of education and develop strategies to enlist and engage them.

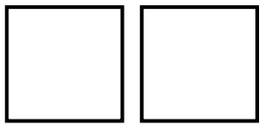
10. Where possible, implement strategies that engage Londoners at the community or neighbourhood level, or carry out a detailed analysis of a comparable project(s) in another Ontario or Canadian jurisdiction.

11. Test the use of new monetary and non-monetary incentives to encourage Londoners to change established energy-using behaviours or habits.

12. Work with the Mayor's Sustainable Energy Council (MSEC), London Hydro, Union Gas to develop additional key indicators and performance measures for community energy use, such as the amount of local energy produced, average building energy efficiency (GJ/m^2 floor area), and the economy-related energy and GHG emission indicators.

13. Work with London Hydro and Union Gas to update energy maps and detailed energy model with more current data (e.g., 2012 data), and determine appropriate frequency for future updates.

14. Report key community energy use and associated greenhouse gas emissions indicators on an annual basis, including but not limited to the annual Community Energy and Greenhouse Gas Emissions Inventory.



SINGLE-FAMILY HOMES

15. Continue to work with London Hydro and Union Gas to explore options for combining water conservation with energy conservation.

16. Work with Union Gas to identify priority neighbourhoods (i.e., “red zones” on energy map) for implementation of their new *Home Reno Rebate* program and *Helping Homes Weatherization* program, and assist in the promotion of these programs.

17. Work with the London Home Builders’ Association (LHBA) to:
    - Explore the potential for a "LEEP 3.0" technology evaluation project
    - Evaluate Toronto's Home Energy Loan Program (LIC pilot)
    - Develop and deliver a draftproofing & insulation demonstration project

18. Work with London Hydro and Union Gas to explore options for providing peer comparison (social benchmarking) information on household energy use to encourage conservation.

19. Use energy mapping resources to develop methodology for measuring the average energy efficiency (energy used per square meter floor area) of new single–family homes.

20. Continue working with LHBA to promote the voluntary use of the next generation of the ENERGY STAR for New Homes initiative, as well as broader “green home” labels (e.g., GreenHouse™ Certified Construction and LEED® Canada for Homes)

MULTI-UNIT RESIDENTIAL BUILDINGS

21. Continue to work with London Hydro and Union Gas to explore options for combining water conservation with energy conservation.

22. Use energy mapping resources to develop methodology for ongoing measurement of the city-wide average energy efficiency (energy used per square meter floor area – all commodities) of multi-unit residential buildings.

23. Determine the share of London’s multi-unit residential properties participating in Natural Resources Canada’s ENERGY STAR Portfolio Manager and other energy performance labelling and benchmarking programs.

COMMERCIAL & INSTITUTIONAL BUILDINGS

24. Continue to work with London Hydro and Union Gas to explore options for combining water conservation with energy conservation.

25. Work with the stakeholders (e.g., London Chapter of the International Facility Management Association, BOMA Toronto) to promote and share existing energy management best practices (e.g., employee awareness & training, monitoring & reporting, etc.) within London’s industrial, commercial, and institutional sector.

26. Determine the share of London’s commercial & institutional property owners voluntarily participating in Natural Resources Canada’s ENERGY STAR Portfolio Manager and other energy performance labelling and benchmarking programs.

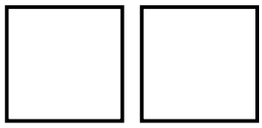
27. Use energy mapping resources to develop the method for ongoing measuring the average energy efficiency (energy used per square meter floor area) of existing and new commercial & institutional buildings on an annual basis.

INDUSTRY AND MANUFACTURING

28. Determine the share of London’s industrial and manufacturing employers (by percentage of employment) that have documented energy management plans, programs, or systems in place.

29. Work with the stakeholders to promote and share existing energy management best practices within London’s industrial, commercial, and institutional sector.

30. Continue to work with London Hydro and Union Gas to explore options for combining water conservation with energy conservation.



STORES, RESTAURANTS, & OTHER SMALL BUSINESSES

31. Continue to work with local business associations, leading businesses, the Chamber of Commerce and local utility conservation and demand management staff on energy and environmental initiatives.

LOCAL ENERGY PRODUCTION AND CO-GENERATION OF HEAT & POWER

32. Work with London District Energy to prepare an information package that can be used by the City's Development Approvals staff to encourage new development in areas served by London District Energy to connect to the system.

33. Work with London District Energy to prepare an information package for use by local architects and developers involved with projects in areas served by London District Energy.

34. Work with London Hydro and the OPA to determine a realistic estimate of and timeline for reaching the maximum potential for cogeneration and renewable electricity-generating capacity in London.

VEHICLES AND THE TRANSPORTATION SYSTEM

35. Carry out the 2030 Transportation Master Plan, as approved by London Municipal Council, for improving London's transportation network to increase walking, cycling, and use of public transit.

36. Carry out the Short-Term Implementation Strategy, as approved by London Municipal Council, for active transportation and transportation demand management.

37. Obtain statistics on the number of high-efficiency vehicles (e.g., hybrids, plug-in hybrids, electric vehicles, diesel, and compressed natural gas) owned in London.

38. Work with Union Gas to encourage major local fleet operators to adopt the use of compressed natural gas (CNG) vehicles.

39. Work with Union Gas and the Biogas Association on a feasibility study for using "green bin" source-separated organics to produce renewable natural gas (RNG) for use in local CNG vehicles.

40. Provide tools and resources to help Londoners assess the cost/benefit of replacing older vehicles with more-efficient new vehicles, vehicle downsizing, and eco-driving techniques. Similarly, provide tools and resources to assist local fleet owners/operators in determining the lifecycle cost/benefit of low/no emission vehicles and other fleet greening practices.

APPENDIX C

SUMMARY OF 2013 COMMUNITY ENERGY AND GREENHOUSE GAS INVENTORY

Overall, the results as demonstrated in the 2013 Inventory Report tell a positive story for the community. Significant progress being made on energy conservation since 2007, the year when energy use and greenhouse gas emissions peaked in London, with associated energy savings and reduction of greenhouse gas emissions. Specific highlights of recent progress include:

- **Improved energy efficiency** – on a per person basis, Londoners and London businesses used seven percent less energy overall in 2013 than used in 2007.
- **Energy savings** - almost $70 million was available for other uses compared to "business as usual" if we'd stayed at 2010 levels of energy efficiency (earliest year of detailed energy cost data.)
- **Reduced environmental footprint** – on a per person basis, Londoners and London businesses released 22 percent fewer greenhouse gas emissions in 2013 than they did in 2007, along with reductions in air pollution emissions.

Other report highlights include:

- London as a whole consumed approximately 57,000 terajoules of energy in 2012, 14 percent above 1990 levels, but two percent below 2007, the year where energy use and greenhouse gas emissions in London reached their peak.
- Compared to the unusually warm winter of 2012, closer-to-normal winter temperatures in 2013 led to a nine percent increase in natural gas use.
- Compared to 2012, transportation fuel use was up five percent. The reason for this increase is not known, although Kent Marketing suspects that the relatively low retail prices for fuel in London may be encouraging out-of-town commuters to fill up in London more often.
- Energy use by sector in London in 2013 was as follows:
  - 43 percent from industrial, commercial, and institutional buildings and facilities;
  - 33 percent from cars and trucks on London's roads; and
  - 24 percent from single-family residential homes.
- Natural gas is the largest source of energy used in London, accounting for 43 percent of all energy used:
  - Gasoline accounted for 25 percent of London's energy use; and
  - Electricity accounted for 21 percent of all of the energy used in London.
- London as a community spent approximately $1.5 billion on energy in 2013, an increase of seven percent from 2012 (Figure C-1):
  - Gasoline costs increased by 7 percent, driven by higher fuel use noted above
  - Electricity costs increased by 13 percent, driven by higher electricity prices
  - Natural gas costs remained unchanged, as lower prices balanced out higher gas use
- London as a whole released approximately 3.1 million tonnes of greenhouse gas emissions in 2013, seven percent below 1990 levels, and 18 percent below London's peak GHG emission levels in 2007 (Figure C-2):
  - Energy use accounts for 96 percent of community greenhouse gas emissions; and landfill gas accounts for the remaining four percent.
  - In addition to the energy reductions noted above, greenhouse gas emissions from Ontario's electricity grid were 70 percent lower than they were ten years ago.

Figure C-1 – Trends in Energy Costs by Energy Commodity

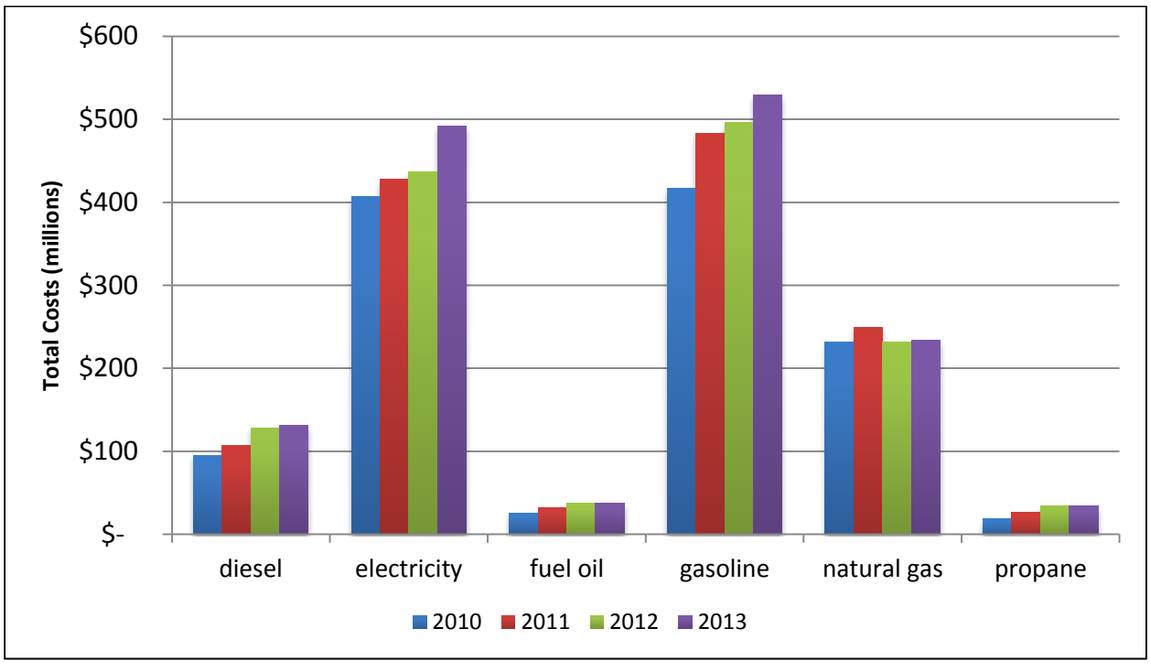
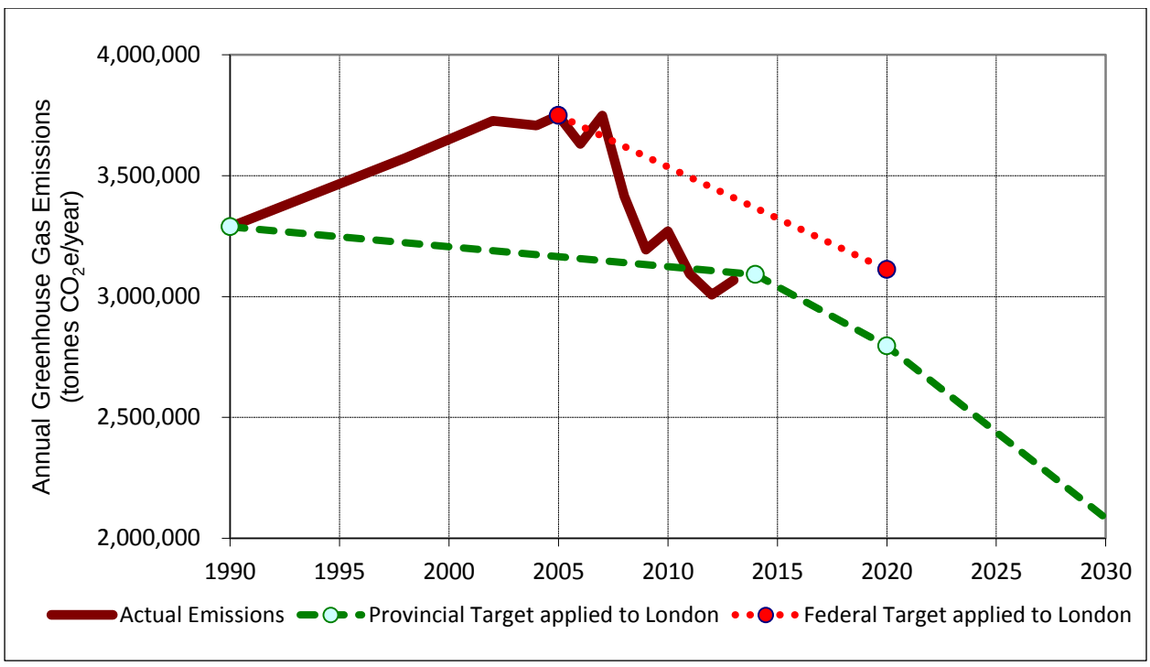


Figure C-2 – London's Greenhouse Gas Emission Trend versus Federal and Provincial Reduction Targets



APPENDIX D

Bill No.

By-law No.

A by-law to approve and authorize the execution of an amendment delivery dates within an existing agreement between the Federation of Canadian Municipalities Green Municipal Fund. and The Corporation of the City of London.

WHEREAS section 5(3) of the *Municipal Act, 2001,* S.O. 2001, c. 25, as amended, provides that a municipal power shall be exercised by by-law;

AND WHEREAS section 9 of the *Municipal Act, 2001*, S.O. 2001, c. 25, as amended, provides that a municipality has the capacity, rights, powers and privileges of a natural person for the purpose of exercising its authority under this or any other Act;

AND WHEREAS it is deemed appropriate for The Corporation of the City of London (the “City”) to amend the existing Grant Agreement for GMF 10311 from the Federation of Canadian Municipalities Green Municipal Fund to change the plan completion date and second grant contribution date;

AND WHEREAS it is appropriate to authorize the Mayor and City Clerk to execute the Agreement on behalf of the City;

NOW THEREFORE the Municipal Council of The Corporation of the City of London enacts as follows:

1. The Amended Agreement with the Federation of Canadian Municipalities Green Municipal Fund with respect to changing the plan completion date and second grant contribution date, attached as Schedule A to this By-law, is hereby approved.

2. The Mayor and City Clerk are authorized to execute the Agreement approved under section 1 of this by-law.

3. This by-law shall come into force and effect on the day it is passed.

PASSED in Open Council July 29, 2014

Joni Baechler
Mayor

Catharine Saunders
City Clerk

First reading – July 29, 2014
Second reading – July 29, 2014
Third reading – July 29, 2014

SCHEDULE A

AMENDED AGREEMENT FOR GMF 10311 WITH THE FEDERATION OF CANADIAN MUNICIPALITIES GREEN MUNICIPAL FUND