

CITY OF VAUGHAN

EXTRACT FROM COUNCIL MEETING MINUTES OF JANUARY 19, 2016

Item 5, Report No. 1, of the Finance, Administration and Audit Committee, which was adopted, as amended, by the Council of the City of Vaughan on January 19, 2016, as follows:

By receiving Communication C5 from the Deputy City Manager, Planning and Growth Management, dated January 14, 2016.

5 2016 RENEWAL OF EMBEDDED ENERGY MANAGER POSITION FOR CITY FACILITIES AND ASSETS

The Finance, Administration and Audit Committee recommends approval of the recommendation contained in the following report of the Deputy City Manager, Planning & Growth Management and the Director of Policy Planning & Environmental Sustainability, dated January 11, 2016:

Recommendation

The Deputy City Manager, of Planning & Growth Management and the Director of Policy Planning & Environmental Sustainability, in consultation with the Director of Financial Planning & Development Finance/Deputy City Treasurer and the Manager of Facilities, recommends:

1. THAT Council endorse the renewal of enrollment in the Embedded Energy Manager Program as a one-year consulting contract in 2016 under the new program structure provided by the Independent Electricity System Operator (IESO) and PowerStream;
2. THAT the 2016 Capital Budget be amended to include a new capital project for this program, funded 80% from the program and 20% from Gas Tax;
3. THAT staff be directed to execute the appropriate agreement with PowerStream;
4. THAT staff be directed to post a Request for Proposals once Council approval and the agreement with PowerStream are secured; and,
5. THAT the inclusion of this matter on a Public Committee or Council agenda with respect to amending the 2016 Capital Budget to add a project for the Embedded Energy Manager Program be deemed as sufficient notice pursuant to Section 2(1)(c) of By-Law 394-2002.

Contribution to Sustainability

The Embedded Energy Manager (EEM) role is directly linked with Green Directions Vaughan Action Item 1.2.5 to encourage local actions to reduce community greenhouse gas reductions. Specifically, the EEM role is an outcome of Council approval of Item 41, Report No. 30 of the June 17, 2014 meeting of the Committee of the Whole regarding Council approval of the Conservation Demand Management Plan on June 24, 2014.

The Embedded Energy Manager role is supported by the Term of Council Priority to "cultivate an environmentally sustainable City", energy conservation objectives in Green Directions Vaughan, and including the City's Community Climate Action Plan and the Clean Air Council Declaration endorsed by Council.

Economic Impact

There is no economic impact as a result of renewing the City's enrollment in the Embedded Energy Manager (EEM) Program as 80% will be funded from the IESO as administered by PowerStream, up to a maximum of \$80,000, and 20% up to a maximum of \$20,000 will be funded from Gas Tax. Staff plan to engage a consultant under a one-year consulting contract in 2016 to facilitate the City's on-going energy conservation initiatives and complete provincially legislated reporting requirements.

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It is anticipated that an Additional Resource Request will be submitted in the 2017 budget cycle to extend the role as a full-time contract position for the remainder of the term of the IESO EEM Program from 2017 to 2020.

Communications Plan

As per Ontario Regulation 397/11, the Energy Conservation and Demand Management Plan is posted on the City's website. The City tracks corporate energy use as one of several sustainability indicators under Green Directions Vaughan, which is available on the City's website as well as the Ministry of Energy website in compliance with Provincial legislation.

Purpose

The purpose of the report is to obtain Council endorsement of the re-enrollment in the Embedded Energy Manager Program provided by the Independent Electricity System Operator (IESO) and administered by PowerStream.

Background - Analysis and Options

Embedded Energy Manager Role

The role of an Embedded Energy Manager (EEM) involves facilitating energy conservation by identifying and implementing various options for saving energy, leading awareness programs, and monitoring energy consumption. As such, EEMs play a critical role in the successful implementation of energy conservation and demand management programs within the industry.

Energy conservation measures must be reported in Quarterly Reports. Quarterly Reports are first submitted to Local Distribution Companies (LDCs) for review and payment purposes and then forwarded to the Technical Reviewer for reporting and technical review purposes.

As part of the Reporting Obligations under the Embedded Energy Manager Agreement V.5.0, all EEMs are required to prepare the following reporting documents:

- EEMs are encouraged to provide the Quarterly Reports as close to the end of each quarter as possible.
- It is recommended that the Quarterly Report be maintained as a living document and used for project tracking purposes, such that it can be provided to the LDC at any time, without need of significant updates.
- An Energy Management Plan (EMP) for each Facility occupied by the Participant, due alongside the second quarterly report.

Embedded Energy Manager as City of Vaughan Sustainability Coordinator-Energy Advisor

In Q3 2014, the Environmental Sustainability Office (ESO) was successful in securing funding from the Ontario Power Authority's Embedded Energy Manager (EEM) program. The program provides 80% funding support toward remuneration and expenses associated with establishing an energy coordinator/advisor for the City of Vaughan over a one year period. The energy manager activities were incorporated into the Sustainability Coordinator position and extended the current contract position with 80% of the remuneration costs provided by the EEM program and the remaining 20% funded through approved department operating budgets. An Additional Resource Request for 2016 was not submitted during the 2016 budget process as the revised EEM Program details were not available to the City.

Vaughan benefits from the subsidy in implementing the Energy Conservation Demand Management Plan (CDM), required under Ontario Regulation 397/11, and endorsed by Council

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EXTRACT FROM COUNCIL MEETING MINUTES OF JANUARY 19, 2016

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on June 24, 2014. The CDM Plan is targeting a 10% reduction in the annual \$4.8M utility costs within Building and Facilities over a five year timeframe. As the City achieves energy reduction targets, it is anticipated that savings in utility costs could be used to off-set the salary and benefits of converting the EEM role to a full time position.

Progress to Date

In 2013, an external auditor compiled a detailed inventory of possible energy efficiency upgrades, including payback scenarios, timelines and associated costs versus savings estimates for 15 of the City's most significant buildings. The audit recommended \$3,798,050 of capital projects resulting in an average payback of 6.3 years and an estimated annual savings of 335 kWh of electricity and 328,410 cubic metres of natural gas. The Energy Conservation Demand Management Plan was developed over a six month period by an internal team of staff in Building & Facilities and Environmental Sustainability supported by PowerStream's Roving Energy Manager. Highlights of the Plan include developing a reduction objective/target and an outline of 11 actions. The internal team has proposed a 10% overall reduction of energy consumption for facilities on per person served basis below the 2011 baseline year by 2020. The recommended energy conservation actions and the audit summary is available as Attachment 1.

Revised EEM Program

The current EEM Program concludes December 31, 2015. The new EEM Program, which is to extend from 2016 to December 31, 2020, offers the option of a salary-based incentive structure or a performance-based option to provide funding for the EEM position. Both options can be implemented as a staff position or consulting contract on a full-time basis. The City is selecting the salary-based option for 2016 as a consulting contract, with the option to move to a performance-based structure and/or staff position in later years. PowerStream is currently preparing Contract/Participant Agreements under the new EEM Program.

Under the salary-based structure, 80% of eligible funding is provided by PowerStream up to a maximum of \$80,000 per year. The energy savings target is 2,000 MWh per year. Under the salary-based option, \$40,000 (50%) is due 60 days from the start of the position. Reconciliation at year end is based on outcomes recorded in quarterly reports and bi-annual energy management plan. Energy savings targets not met may be rolled into targets for following years. The performance-based option provides \$40/MWh of gross verified energy savings up to a maximum of \$150,000 per year.

For 2017 to December 31, 2020, it is anticipated that staff will submit an Additional Resource Request for the EEM as a staff contract. It will be decided through 2016 in partnership with PowerStream whether it is maintained as a salary-based role or moved to the performance-based structure.

Deliverables of the EEM Consulting Contract

A Request for Proposals (RFP) will be issued once Council approval and the agreement with PowerStream are secured. The RFP will include, but not be limited to, the following deliverables:

- Assess the current baseline information and monitoring systems;
- Identify gaps and weaknesses, also in consideration of the City's five year energy management plan (Conservation Demand Management Plan) filed in accordance with the *Ontario Energy Conservation Leadership Act*;
- Identify ways of achieving efficiencies and maintaining accurate and timely records and reporting;

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- Recommend an auditing strategy, scalable to accommodate future growth, that would include the necessary technology and system upgrades to make efficient monitoring possible;
- Identify costs;
- Meet all reporting requirements of the EEM Program; and
- Recommend an implementation strategy.

Relationship to Term of Council Service Excellence Strategy Map (2014-2018)

The Embedded Energy Manager role is supported by the Term of Council Priority to "cultivate an environmentally sustainable City".

Regional Implications

There are no regional implications by participating in the subsidy program provided by the Province.

Conclusion

The Embedded Energy Manager (EEM) Program provides a significant contribution to the City's efforts to save costs of operating and maintaining City assets and to reduce greenhouse gas emissions by reducing energy use. The role of the EEM is directly supported by specific action items in Green Directions Vaughan and more generally by the Term of Council Priority to "cultivate an environmentally sustainable City".

Attachments

1. Energy Efficiency Audit Summary from the Energy Conservation Demand Management Plan.
2. Energy Conservation and Demand Management Plan, June 2014

Report prepared by:

Elizabeth Linley, Sustainability Coordinator-Energy Advisor,
Policy Planning & Environmental Sustainability
Tony Iacobelli, Manager of Environmental Sustainability,
Policy Planning & Environmental Sustainability
Dave Merriman, Manager of Facilities, Buildings & Facilities

(A copy of the attachments referred to in the foregoing have been forwarded to each Member of Council and a copy thereof is also on file in the office of the City Clerk.)

DATE: JANUARY 14, 2016
TO: MAYOR AND MEMBERS OF COUNCIL
FROM: JOHN MACKENZIE, DEPUTY CITY MANAGER
PLANNING AND GROWTH MANAGEMENT
SUBJECT: COMMUNICATION

C	5
Item #	5
Report No.	1 (FAA)
Council - January 19/16	

**ITEM #5, REPORT #1 – FINANCE, ADMINISTRATION AND AUDIT
COMMITTEE – JANUARY 11, 2016**

**2016 RENEWAL OF EMBEDDED ENERGY MANAGER POSITION
FOR CITY FACILITIES AND ASSETS**

In response to the inquiry at the Finance, Administration and Audit Committee about the work of the Embedded Energy Manager, we are pleased to provide the following information.

In 2009, Ontario Regulation 397/11 directed all public agencies in Ontario to prepare, publicly report, and implement energy conservation and demand management plans. The City's "Energy Conservation and Demand Management Plan, 2014" was approved by Council on June 24, 2014 in accordance with O. Reg. 397/11. It is the guiding document to implement energy efficiency projects to reduce corporate energy use, reduce GHG emissions, and realize operating cost savings. Projects outlined in the "Energy Conservation and Demand Management Plan, 2014", when implemented, can provide a 10% savings in the annual \$6M energy cost paid by the City.

The Sustainability Coordinator - Energy, in the office of Environmental Sustainability, fulfilled the role of the Embedded Energy Manager (EEM) in 2015. This was the first year for the EEM in the City. In previous years, a Roving Energy Manager operated with the City of Vaughan, the Town of Richmond Hill and Canada's Wonderland. A dedicated EEM has been critical to implementing the City's "Energy Conservation and Demand Management Plan, 2014" and to improving the participation level of the City in the Energy Manager program of the Electricity System Operator (IESO) in advancing energy retrofit projects and realizing incentive financing.

The following work was achieved in 2015.

Energy Use Reporting in Accordance with Ontario Regulation 397/11

Ontario Regulation 397/11 mandates annual reporting of energy consumption and greenhouse gas emissions from City facilities starting on July 1, 2013. Energy conservation and demand management reports are revised every five years.

- The EEM is responsible for compiling the data for submission to the Province in accordance with O. Reg. 397/11. Until electricity and natural gas data is more readily available from utilities, this is a lengthy process, involving compiling information from utility bills for all City facilities for the July 1, 2015 submission date.

Advancing Energy Conservation Projects under the "Energy Conservation and Demand Management Plan, 2014"

Through 2015, the EEM documented projects underway or under investigation for quarterly reporting to PowerStream and the IESO. Quarterly reporting follows the IESO Energy Manager program requirements and the funding agreement with PowerStream and has been critical to implementing the

“Energy Conservation and Demand Management Plan, 2014”. The following milestones are a direct result of the efforts of the EEM in 2015:

- Documented 2.5 GWh of savings from projects either underway or under investigation;
- Documented 20 additional applications (projects) in 2015 for energy and GHG emissions reductions, whereas 10 applications were documented in the previous 3 years using a Roving Energy Manager; and
- Identified \$100,000 in incentives, essentially a rebate to the City, from a variety of applications submitted in the required quarterly reports to PowerStream and the IESO (for example, a \$50,000 LED light retrofit project receives \$13,000 in incentive financing).

City of Vaughan Municipal Energy Plan

In 2013, the Ministry of Energy (MOE) announced that it would be supporting local energy planning in Ontario by launching the Municipal Energy Plan (MEP) program. In early 2014, the City of Vaughan approved its first Community Climate Action Plan (CCAP) focused on the reduction of community GHG emissions. The newly released Municipal Energy Plan program presented the City with an opportunity to delve further into understanding local energy needs and consumption patterns from a geographical perspective and presented an opportunity to align the CCAP within the MEP framework. Vaughan was one of the first eight municipalities to receive funding from the MOE to develop a Municipal Energy Plan:

- Through existing contacts with utilities and Provincial staff, the EEM was instrumental in obtaining data used by the consulting team in the baseline energy analysis and energy forecasting, which is a key component of the MEP.
- The EEM provided milestone reports to the MOE in accordance with the funding agreement between the City and the Province.

Research & Engagement Initiatives – Encouraging a “Culture of Conservation”

The EEM is also responsible for researching new initiatives focused on reducing energy and improving efficiency in City buildings. Some initiatives investigated in 2015 included:

- Solar glazing opportunities for City Hall to stabilize indoor air temperatures in areas identified as ‘hot spots’;
- Sub-metering policies to ensure efficient operation of corporate building stock;
- Exploring BOMA BEST certification for City Hall by leveraging the attributes and technologies already employed to achieve LEED certification (BOMA BEST is a framework that examines energy; water; waste reductions; emissions and effluents; indoor environment; and environmental management systems.); and
- Identified recommendations to incorporate climate change and energy efficiency regulations into the Municipal Act Review in consultation with the Clean Air Partnership.

Furthermore, the EEM consulted with various departments at the City of Vaughan to ensure smart energy planning and energy conservation efforts were integrated into project planning. For example, the EEM consulted with Policy Planning to influence Community Energy Plans for Blocks 27 and 41. The EEM is available to consult with and advise staff on energy conservation opportunities and support implementation of various initiatives across the organization.

The EEM played a key role in engaging City of Vaughan staff in energy conservation efforts. The EEM utilized the existing ‘Caught Greenhanded’ campaign delivered by the Environmental Sustainability Team to focus on ways staff can reduce their energy consumption and receive recognition. The EEM, with support from the Internal Advisory Team for Environmental Sustainability, conducted a desk drop of the Caught Greenhanded door hangers at City Hall, the JOC, and all of the community centres to engage staff in energy conscious behaviours. The EEM developed the Building Operators Challenge, a friendly competition expected to roll out in 2016, to challenge building operators of City facilities to reduce their electricity and natural gas consumption.

The year 2015 put in place a foundation for continuing improvement in energy performance. This will be particularly important given the Province's expected release of its Climate Change Plan later this year.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'John Mackenzie', with a large, stylized initial 'J' and a horizontal line extending to the right.

JOHN MACKENZIE
Deputy City Manager
Planning and Growth Management

/lm

Attachment

n/a

Copy To: Steve Kanellakos, City Manager
Jeffrey A. Abrams, City Clerk
Roy McQuillin, Director of Policy Planning and Environmental Sustainability
Tony Iacobelli, Manager of Environmental Sustainability

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Regional Implications

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Respectfully submitted,

JOHN MACKENZIE
Deputy City Manager
Planning & Growth Management

per: ROY MCQUILLIN
Director of Policy Planning &
Environmental Sustainability

/LM

Energy Audit Summary

ATTACHMENT 1 City of Vaughan

Ref #	Building Name	Estimated Annual Utility Savings				Estimated Annual Cost Savings	Capital Cost	Available Incentives	Net Cost of Retrofit	Simple Payback
		Elec.	Elec.	Gas	Water					
		kWh	kW	m³	m³	\$	\$	\$	\$	Years
1	Al Palladini CC	571,600	32	22,240	7,180	85,700	546,500	-28,500	518,000	6.04
2	Chancellor CC	219,500	34	8,590	1,690	29,950	233,150	-17,800	215,350	7.19
3	Dufferin Clark CC	186,200	31	41,310	6,570	49,750	255,900	-21,350	234,550	4.71
4	Father Ermano Bulfon CC	258,050	25	19,740	2,190	39,650	262,950	-14,750	248,200	6.26
5	Garnet A Williams CC	532,200	36	70,980	6,170	93,050	675,200	-37,600	637,600	6.85
6	North Thornhill CC	501,150	60	17,970	4,400	72,200	321,000	-29,750	291,250	4.03
7	Maple CC	290,000	37	105,720	6,120	79,300	523,450	-29,250	494,200	6.23
8	Rosemount CC	128,400	15	20,160	2,590	28,750	164,400	-12,800	151,600	5.27
9	Thornhill Outdoor Pool	6,800	0	9,410	1,520	7,950	62,200	-1,100	61,100	7.69
10	Woodbridge Pool & Arena	297,600	18	1,310	1,010	34,400	256,400	-11,850	244,550	7.11
11	Vellore Village CC	162,400	10	18,630	5,100	35,750	220,100	-5,950	214,150	5.99
12	Joint Operations Centre	398,900	23	-10,120	1,200	42,050	445,350	-10,600	434,750	10.34
13	Fire Hall 71	19,000	4	4,690	150	4,050	30,500	-1,550	28,950	7.15
14	Bathurst Clark Library	188,400	8	-3,010	560	22,500	145,800	-12,650	133,150	5.92
15	Pierre Berton Library	37,850	2	790	20	4,650	31,000	-2,500	28,500	6.13
	Total Estimated Savings	3,798,050	335	328,410	46,470	\$629,700	\$4,173,900	-\$238,000	\$3,935,900	6.3



ENERGY CONSERVATION AND DEMAND MANAGEMENT PLAN

JUNE 2014

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1. INTRODUCTION

Energy costs related to the operation of our facilities and infrastructure continue to be a significant component of our overall operating costs. Energy management is necessary to mitigate the impact these costs potentially could have on the delivery of programs and services.

In April 2009, Council approved *Green Directions Vaughan* (GDV), our Community Sustainability and Environmental Master Plan, which contained a framework of initiatives to improve the City's operational and regulatory functions. Within the Plan was a commitment to reduce use of natural resources, develop a corporate as well as community action plan to reduce greenhouse gases as well as demonstrate leadership on sustainability issues.

In 2009, Ontario Regulation 397/11 directed all public agencies in Ontario to prepare, publicly report, and implement energy conservation and demand management plans. It also mandates annual reporting of energy consumption and greenhouse gas emissions starting on July 1, 2013. Energy conservation and demand management reports are required by July 1, 2014 and every fifth anniversary thereafter.

1.1 Purpose of the Energy Management Plan

The Energy Conservation and Demand Management Plan (CDM) is a document that structures resources and methodologies utilized in improving energy efficiency and energy management effectiveness. It is intended to be a road map for best practice energy management to deliver energy savings in an effective and flexible manner.

Energy management includes electricity, natural gas and corporate fuel consumption, as well as water commodity management. The CDM Plan defines actions in the following key areas:

- Energy management information system
- Energy training and awareness
- Facility operations
- Energy conservation in existing facilities
- New construction
- Renewable energy
- On-site generation and demand response
- Street and traffic lighting
- Development of culture of energy conservation
- Financial considerations

2. OUR ORGANIZATION

This section provides additional context relating to energy management pertinent to the organization as a whole.

2.1 City of Vaughan Profile

This section provides an overview of size and type of buildings operated by the City as well as an overview of streetlights.

2.1.1 Facilities Summary

Table 2.1 presents a summary of all City of Vaughan corporate facilities per category highlighting the significant gross floor area and unique types of facilities being operated.

Table 2.1: Overview of corporate facilities

Building Category	Total Gross Floor Area (ft ²)	Number of Facilities
Administrative	601,414	18
Community Centres	761,128	11
Cultural Facilities	30,327	15
Indoor Recreational Facilities	10,013	3
Public Libraries	270,313	8
Totals	1,673,195	55

2.1.2 Street Light Summary

Street lighting fixtures in the City of Vaughan currently utilize a mix of high pressure sodium and Light emitting Diode (LED) bulbs. In 2010, the City implemented a pilot project installing 1,800 LED streetlights in industrial areas. There are approximately 33,000 street lighting assets.

Public Works and Engineering staff will be compiling a detailed inventory of our streetlights as part of the retrofit project.

Table 2.3 depicts total street light and traffic light energy consumption in kWh and the associated energy costs. It illustrates the significant energy consumption of streetlights within the City of Vaughan.

Table 2.3: Street light energy consumption and costs

Lighting Category	2008 Energy Consumption (kWh)	2008 Cost
Street light	12,962,214	\$1,327,383.60
Traffic light	718,491	\$77,933.85
Totals	13,680,705	\$1,405,317.45

2.2 Current Energy Consumption

The regular collection and analysis of energy use information establishes the basis for energy management, and energy use and cost control. Quantifying the City's corporate energy consumption and costs allow staff to identify where energy consumption deviates from established patterns and targets and where corrective action is required.

In 2013, the City of Vaughan, working with Finn Projects, conducted ASHRAE Level II energy audits on 15 City of Vaughan facilities. Information garnered from this energy audit is already being used to help identify and develop measures that can reduce energy consumption and related greenhouse gas (GHG) emissions, as well as reduce energy and operating costs. Additionally, as part of the City's reporting requirements to meet Energy Conservation and Demand Management Plans Regulation (O.Reg. 397/11), the City of Vaughan also compiled energy consumption data and costs for all 55 City facilities. Table 3 highlights energy costs from various areas of operation.

Table 3: Corporate energy consumption and costs

Commodity	Quantity		Cost	Rate per Unit	
Electricity (kWh)					
Street Lights*	12,962,214	kWh	\$1,327,383	0.10	\$/kWh
Traffic Lights*	718,491	kWh	\$77,934	0.11	\$/kWh
Facilities*	33,352,607	kWh	\$ 3,335,260	0.10	\$/kWh
Natural Gas (m³)					
Facilities	5,139,397	m³	\$ 1,541,819	0.30	\$/m³
Total Cost			\$ 6,282,396		

***Note: Street Light and Traffic Light data from 2008. Facilities and Natural Gas data from 2011 including estimated cost.**

2.3 Greenhouse Gas (GHG) Emissions

Under *Green Directions Vaughan*, the City of Vaughan is committed to reducing greenhouse gas (GHG) emissions that contribute to climate change and which adversely affect local air quality. To this end, the City of Vaughan has joined the Partners for Climate Protection (PCP) program - a voluntary five-milestone framework used to guide municipalities to reduce greenhouse gas emissions. The PCP framework is widely used throughout Canada to audit GHG emissions, identify how GHG emissions can be reduced and demonstrate measurable results for GHG emission reductions.

Under the City's commitments to the PCP program and in compliance with the Energy Conservation and Demand Management Plans Regulation (O.Reg. 397/11), the City of Vaughan reports on its annual energy use and greenhouse gas (GHG) emissions. Table 4 highlights equivalent carbon dioxide emissions, a measure of greenhouse gas warming potential, for our largest operational sources.

Table 4: Corporate eCO₂ emissions by source

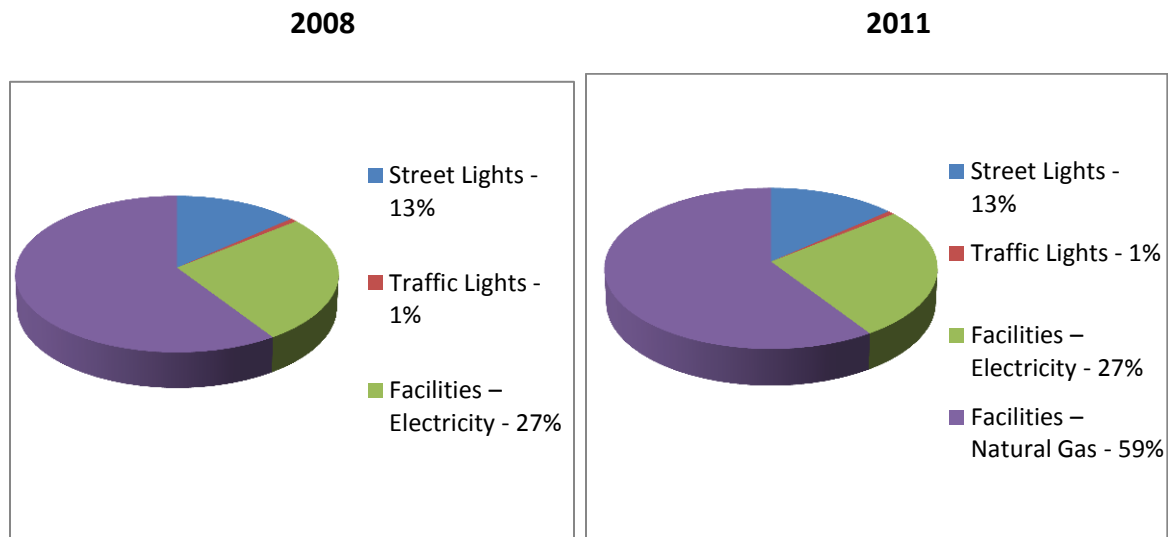
Source Category	Total eCO ₂ (t) ¹ 2008	Total eCO ₂ (t) ² 2011
Street Lights*	2,204	2,204
Traffic Lights*	122	122
Facilities – Electricity	4,810	4,336
Facilities – Natural Gas	4,501	9,719
Totals	11,637	16,381

***Note: Street Light and Traffic Light data is only available for 2008. While Facilities and Natural Gas data is available for both 2008 and 2011.**

¹ e CO₂ emissions for 2008 were calculated using the emission coefficient rates (0.000170 for kWh/electricity and 0.001891 for m³/natural gas) for Ontario for 2008 as reported by ICLEI as part of the Partners for Climate Protection Milestone program.

² e CO₂ emissions for 2011 were calculated using the emission coefficient rates (0.000130 for kWh/electricity and 0.001891 for m³/natural gas) for Ontario for 2011 the Partners for Climate Protection Milestone Tool developed by ICLEI Canada, <http://www.icleicanada.org/pcptool>. The decline in the emission coefficient for kWh/electricity from 2008 to 2011 is due to the gradual decommissioning of the coal-fired power plants in Ontario. This decline will also be reflected in data from 2011 to the present year.

Figure 1: Corporate GHG emissions by source for 2008 and 2011



All GHG values are CO₂e values in metric tonnes and are estimated based on best practices. . *

Note: Street Light and Traffic Light data is only available for 2008. While Facilities and Natural Gas data is available for both 2008 and 2011

Figure 1 illustrates that the GHG values for corporate operations have not changed over the 2008-2011 time period.

2.4 Key Stakeholders

This section notes the stakeholders who have an interest in the Energy Conservation and Demand Management Plan.

2.4.1 Vaughan City Council

City Council comprised of the Mayor and City Councillors have a crucial role to play in setting the political framework for the Conservation Demand Management plan. Demonstrating the City's commitment to environmental sustainability and sustainable development, Council approved *Green Directions Vaughan*, the City's Community Sustainability and Environmental Master Plan as presented in Section 2.2 of this plan.

2.4.2 Senior Management Team

The senior management team is responsible for creating the administrative framework and for providing leadership to City staff in the development and implementation of the energy initiatives resulting from the CDM Plan.

2.4.3 Vaughan City Staff

Many City staff and multiple City departments were involved in developing this CDM plan and will be instrumental in working to initiate and implement the associated energy management initiatives across the organization.

The internal Energy Conservation & Demand Management Team will consist of the following key team members:

Role	Department
Manager, Environmental Sustainability	Environmental Sustainability Office
Sustainability Coordinator	Environmental Sustainability Office
Electrical Supervisor	Building and Facilities
Mechanical Supervisor	Building and Facilities
Manager of Facilities	Building and Facilities
Roving Energy Manager	PowerStream

2.4.4 Ontario Ministry of Energy

In compliance with the Energy Conservation and Demand Management Plans Regulation (O.Reg. 397/11), and as part of the *Green Energy Act*, the City of Vaughan is committed to reporting on its annual energy use and greenhouse gas (GHG) emissions. Under these reporting requirements, the Ontario Ministry of Energy will be a key stakeholder in this CDM initiative.

3. GOALS AND OBJECTIVES

This section outlines the goals, objectives and targets for the Energy Conservation and Demand Management Plan.

3.1 Goals

The City of Vaughan Energy Conservation and Demand Management (CDM) Plan is guided by the same ethic established in GDV which speaks to determining the impact of decisions on the environment, weighing the social/cultural consequences and understanding financial implications.

Green Directions Vaughan actions 1.1.3 and 1.1.5, under the goal of significantly reducing use of the City's use of natural resources, make reference to the need to develop a corporate greenhouse gas emission reduction plan that move towards carbon neutrality for the City of Vaughan's facilities and infrastructure.

Commitment towards these ethics and goals will guide the City of Vaughan to comply with Ontario Regulation 397/11 under the *Green Energy Act* that requires public agencies to prepare, make available and implement energy conservation and demand management plans.

3.2 Objectives

Implementation of the Energy Conservation and Demand Management Plan will strive to achieve the following objectives aligned with the above goals and ethics.

- To continue to create a sustainability culture that embraces energy efficiency;
- To promote sustainable resource use through energy conservation, energy efficiency and support of renewable energy initiatives;
- To reduce energy operating and maintenance costs through implementation of best practices and advanced technologies; and
- To continue to enhance the comfort and safety of users of city facilities.

3.3 Targets

As the City of Vaughan continues to grow, the usage of our city facilities will continue to rise to meet the service needs of the community. As a result, we may see an absolute increase in the energy usage. Through implementation of the actions outlined in this Plan, corporate emissions are targeted to be reduced by 10% per person below the 2011 baseline year by 2020. Using 2011 as baseline, the following targets are established within this five year CDM Plan:

- 10% overall reduction of energy consumption for facilities on per person served basis (ekWh/ft²)
- 10% reduction of water consumption for facilities on per person served basis (m³/ft²)³
- 10% reduction of energy cost for facilities (adjusted for utility escalation rate) (\$/ft²)⁴
- 20% reduction of electricity consumption for street lighting (kWh)⁵

4. INFORMATION SYSTEM INTEGRATION

This section highlights the role information plays in the Energy Conservation and Demand Management Plan.

³ This water reduction target does not include water consumption for parks irrigation and road side horticulture.

⁴ The cost reduction target is greater than the above energy consumption target as a result of shifting consumption from higher cost energy (electricity) to lower cost energy (natural gas) as well as implementing demand response and load shifting from higher cost peak hours to lower cost off peak hours for electrical consumption.

⁵ Assumes a street light retrofit program is initiated in years 4/5 of the plan subject to satisfactory business case.

4.1 Energy Metering

For a large user of energy, an important first step is to develop a thorough understanding of all energy consumption and associated costs. This can be accomplished with comprehensive metering, measurement and an Energy Management Information System (EMIS).

Real time management requires real time consumption data to be collected by the EMIS for analysis. This allows senior facility staff to react and respond to higher priced times of the day by managing energy in concert with the market. Therefore an ultimate goal would be to have meters and an EMIS that have the ability to transmit and receive real time energy data. The energy data reports and subsequent analysis and reports created by the EMIS would provide opportunities for improvement, reduce energy consumption, control energy costs, mitigate risk, and optimize conservation and demand management.

Action	Improve energy tracking through implementation of Energy Management Information System
Status	Utility Trac®, an energy tracking tool, was acquired in Q2, 2014 and is being populated with historical electricity and natural gas consumption data.
Next Steps	Develop a system to add monthly utility data to Utility trac® as well as review and analyze on a regular basis.
Timeframe	2014-15

Action	Enhance energy metering
Status	Interval meters measuring electricity use were installed at the 10 largest electric demand facilities in Q1, 2013. Staff training on meter usage occurred Q2, 2014.
Next Steps	Explore the feasibility of integrating real time meters with Utility trac system, more granular monitoring and adding natural gas meters.
Timeframe	2016-17

4.2 Smart Buildings

A smart or intelligent building integrates building systems (Heating Ventilation Air Conditioning, Lighting, Security, EMIS, etc.) in order to reduce energy consumption and environmental impact. These systems provide increased efficiency while leading to energy cost savings.

The Energy Conservation and Demand Management Plan recommends a comprehensive system integration for all new facilities and major retrofit projects. Energy related systems such as building automation systems, lighting controls, ice plant controls, pool equipment controls should be included as part of a smart building system.

Action	The City of Vaughan is continuing to implement integration of building systems. Some examples include lighting system controls for City Hall with the Building Automation System.
Status	Other opportunities will be continued to be evaluated.
Next Steps	Define integration specifications for new buildings or major retrofit projects
Timeframe	Ongoing

4.3 Performance Indicators

The City of Vaughan, through the implementation of *Green Directions Vaughan*, our Community Sustainability and Environmental Master Plan, and development of departmental business plans include performance indicators. These indicators help to monitor progress in achieving various corporate and departmental goals.

The following performance indicators will be used to help monitor progress in the implementation of the Energy Conservation and Demand Management Plan.

- Corporate Greenhouse gas emissions per resident served (eCO₂-equivalent carbon dioxide/pp);
- Energy Utilisation Index (EUI) (ekWh/ft², ekW/ft²,ekWh/user/y);
- Total Energy Cost Intensity (\$/ft²/yr);and
- Employee Awareness Index (Hours of training/employee/year)

These performance indicators will be reviewed annually to evaluate their effectiveness in advancing the key objectives and modified accordingly.

5. FACILITY OPERATIONS

This section highlights the facility operation activities that have an impact on achieving energy savings.

5.1 Operations Procedures

Standard operation procedures will continue to be developed for major electrical and mechanical systems in similar facilities (arenas, pool, libraries, etc.). These operation procedures will allow the optimization of building systems and easy transfer of knowledge between facility operation personnel.

5.2 Maintenance Program

Monitoring energy use through the Energy Management Information System (EMIS) will assist with identifying anomalies in building performance. Individual meter testing on equipment can also assist with equipment diagnostics and troubleshooting.

By recording energy use for equipment parameters, the EMIS can identify hydro peaks and abnormal energy consumption. Regular maintenance work orders can be issued to monitor and correct the performance of the equipment before the equipment fails, increasing reliability and flexibility in planning for replacement. At the same time, maintenance work orders can trigger the implementation of energy conservation measures.

Action	Integrate energy monitoring with maintenance activities.
Status	Evaluating opportunities to align monitoring activities with maintenance.
Next Steps	Determine approaches which could be implemented to ensure monitoring activities closely aligned with maintenance.
Timeframe	Ongoing

6. ENERGY CONSERVATION IN EXISTING FACILITIES

This section highlights benchmarking measures and potential energy conservation measures warranting further evaluation.

6.1 ENERGY STAR® Portfolio Manager

Portfolio Manager is an interactive energy management tool that allows you to track and assess energy and water consumption across an entire portfolio of buildings in a secure online environment. Whether an organization owns, manages, or holds properties for investment, Portfolio Manager can help set investment priorities, identify under-performing buildings, verify efficiency improvements, and receive recognition for superior energy performance. The ENERGY STAR® tool will offer a starting point in benchmarking City facilities until enough data is collected by the EMIS.

Action	Benchmarking
Status	Further research required to determine
Next Steps	Upload utility data on ENERGY STAR® Portfolio Manager for a select number of community centres on a trial basis. Supported through Environmental Sustainability Office staff resources.
Timeframe	2014-2015

6.2 Building Retrofit Actions

As part of the energy management process, energy audits were completed in 15 city facilities in Q4, 2013. The audit reports identified energy conservation measures grouped in the following categories:

- Building envelope
- Lighting systems and controls

- Mechanical systems
- Electrical systems
- Building automation
- Water systems
- Training and awareness

Utility savings for electricity, natural gas and water are presented in Table 5.

Table 5: Utilities saving from energy savings measures

Energy Savings Measure	Total Energy Savings	Total Cost Savings (\$)	Net capital costs (\$)	Ave Payback (years)
Building envelope Controls	25, 830 m ³	9,750	22,150	3.1
	36,700 kWh 300 m ³	3,900	10,200	3.2
Cooling Tower fan	25,750 kWh	2,850	22,300	8.6
Domestic Hot Water	41,800 kWh 118,540 kWh	40,700	\$ 405,650	11.1
Fuel Switch	308,250 kWh 28,850 m ³	23,600	\$ 219,700	10.7
Heat rejection Heating	48,850 kWh	5,150	51,550	10.7
	484,400 kWh 57,710 m ³	69,400	789,800	10.2
Lighting Retrofit Monitoring, Tracking, Training	2,017,800 kWh	214,600	1,308,600	6.0
	434,250 kWh 53,690 m ³	76,450	228,050	4.4
Pumps	112,200 kWh	11,750	100,950	10.1
Ventilation	288,250 kWh 12,300 m ³	35,200	225,000	7.0
Water conservation	82,040 m ³ (gas) 40, 800 m ³ (water savings)	131,550	510,150	4.2
Total	3,798,050 kWh 328,410 m³	627,700	3,935,900	

Action	Energy Conservation measures
Status	Implementing energy conservation measures identified within the energy audits is a key element of the CDM Plan implementation.
Next Steps	Schedule energy retrofit measures implementation according to building priority and funding available for each year of the CDM Plan implementation Coordinate capital retrofit measures recommended in the CDM Plan with the corporate facility capital improvements funding available for each year of the CDM Plan. Initiatives will be reviewed and presented as part of the Capital Budget process annually.
Timeframe	Timeline based on approved funding

6.3 Continuous commissioning

Continuous commissioning involves applying the systematic commissioning process to existing buildings in order to improve performance of building systems. In order to select which facilities should be considered the following criterion should be considered:

- High Energy Utilisation Index (EUI) (ekWh/ft², ekW/ft²,ekWh/user/y)
- Chronic failure of equipment and/or control systems
- Complaints related to building performance

Continuous-commissioning is a cost-effective method of improving building energy efficiency, as it relies less on new equipment that requires capital costs and more on returning equipment operation to the initial performance. Continuous-commissioning projects could be considered in situations where mechanical and building automation system upgrades are targeted for improvements.

Action	Continuous-commissioning
Status	Continue to collect energy data to support the tracking of performance indicators such as the Energy Utilisation Index.
Next Steps	Identify potential opportunities for -commissioning particularly those facilities that show an increasing energy consumption trend over time and consider future utilization plans. Utilize the corporate energy team to help plan the retro-commissioning process.
Timeframe	2016

7. NEW CONSTRUCTION

The City of Vaughan's has developed and implemented a Vaughan green building policy, which will ensure that all new and existing municipal buildings perform to the highest environmental

standards that are practical taking into account such considerations as energy efficiency, greenhouse gas emissions. The policy is to build new facilities to LEED Silver where practical.

Action	New construction
Status	Continue to cite LEED Silver for new municipal buildings.
Next Steps	Continue to document the energy savings achieved from LEED Silver building standard.
Timeframe	Ongoing

8. DEMAND RESPONSE

The energy usage of municipal facilities is mainly attributable to electricity and natural gas for the purposes of heating, cooling and addressing power loads.

The Province has developed a demand response program for large industrial, commercial and institutional organizations to receive economic incentives to reduce consumption. The program pays participants for turning down their electricity by a specified amount when Ontario's electricity system reaches certain pre-established targets. There are several potential ways for municipalities to be involved in demand response including using stand-by generators, thermal and load shifting.

Action	Demand response
Status	Work with one of three aggregators, approved by the Ontario Power Authority, to determine what potential opportunities exist to participate in the Demand response program.
Next Steps	Monitor available technology and market conditions to investigate the economic feasibility of on-site generation projects, thermal storage initiatives and load shifting opportunities.
Timeframe	Ongoing

9. STREET LIGHTING

Significant energy reduction in street lighting is possible through the conversion of the City's existing High Pressure Sodium (HPS) street lights to LED technology. Street lighting in the city currently accounts for approximately 12% of energy used from the City.

LED technology can deliver energy savings of 50 to 70% when compared with the consumption of the city's existing HPS lights. The LED fixtures also have a much longer life reducing maintenance costs on bulb replacement cycles. Total annual operating cost savings for converting to LED technology would be significant however the capital cost of a replacement program is also very high.

Additional analysis will be required in the preparation of a business case to support a replacement program. There are also design issues that will need to be addressed due to the different nature of the light from these two sources. The city's Engineering department is currently undertaking a review of the city's street light design standards including an assessment of LED technology. Alternative financing arrangements for implementation may also be possible through energy performance contracting and will need to be evaluated further prior to any decision to proceed

Action	Explore the feasibility of a large scale LED street light retrofit.
Status	Continuing to update inventory of street lighting assets with additional details (i.e lighting levels, watts, etc)
Next Steps	Prepare business case including financing alternative for retrofit program
Timeframe	Q2-2017

10. CORPORATE ENERGY CONSERVATION CULTURE AND COMMUNICATIONS PLAN

Culture is often referred to as shared assumptions and values as well as expected behaviours and symbols. If the City of Vaughan expects to build on the sustainability culture it started to establish in the implementation of *Green Directions Vaughan*, then inclusion of an energy conservation culture should be natural inclusion. An organization's culture guides the decisions of its members by establishing and reinforcing expectations about what is valued and how things should be done. In order for the CDM Plan to succeed it will be dependent on the commitment to building a culture of energy conservation that will modify building occupants' behaviour towards energy conservation.

10.1 Energy Training

Training programs for staff will help them to understand the importance of energy management while providing them with the technical knowledge and skills required to make informed energy decisions. Employee feedback and program evaluation can also be gathered in these staff training sessions.

Staff training will be employed to achieve:

1. Sensitivity to energy management, energy efficiency and energy cost issues.
2. Familiarity with new energy technology, equipment, process, and operational methods.
3. Staff training will be performed at the following levels:
 - Management
 - Engineering/Technical/Supervisory
 - Operators

The following matrix depicts the training and objectives at each level.

Table 6: Training approach

Organizational Level	Type of Training	Training Objectives
Management	<ul style="list-style-type: none"> • Sensitivity to energy management, energy efficiency and energy cost issues • Familiarity with information and data reporting • Familiarity with evaluation of process and CDM plan 	<ul style="list-style-type: none"> • Acquire insight into energy cost drivers and energy efficiency • Provide support to the CDM plan implementation • Provide program guidance, motivation, leadership, and encouragement to staff
Engineering, Technical, Supervisory	<ul style="list-style-type: none"> • Familiarity with new technology, equipment, processes and operational methods • Awareness of energy conservation opportunities • Familiarity with information and data reporting • Familiarity with evaluation of process and CDM plan 	<ul style="list-style-type: none"> • Increased familiarity with new energy efficient technologies, equipment, processes, and operational methods • Provide operator training and guidance • Train and encourage staff to recommend/initiate energy conservation projects and proposals to senior management
Operators	<ul style="list-style-type: none"> • Technical knowledge of systems and equipment • Technical knowledge of maintenance and reduction of loss/waste • Familiarity with operating procedures for energy efficiency • Awareness of energy conservation opportunities 	<ul style="list-style-type: none"> • Operate systems and equipment more efficiently • Reduce energy usage and operating costs • Initiate effective preventative maintenance plans • Champion the culture of energy efficiency and energy cost reduction

As the training program is implemented, energy performance and management measures and metrics will be included in the performance evaluations for facility operations staff.

10.2 Energy Awareness

Front line staff and visitors must be supportive of the building operators as champions in order for an energy conservation culture to materialize. An employee engagement initiative on energy conservation along with a communication plan provides a good foundation to create an energy conservation culture. Community based social marketing strategies can be utilized as a component of the employee engagement efforts. Providing information on performance indicators, outlining expectations from City staff and visitors and sharing information on energy efficiency measures can also help raise awareness towards energy efficiency.

In order to ensure a supportive system for the implementation of the Conservation Demand Management Plan, an effort must first be made to expand the organizational awareness of energy efficiency and conservation and to establish a strong understanding of the connection between energy conservation and energy cost-effectiveness. Embedding this awareness and understanding within the broader organizational culture will require ongoing communication and staff training.

This ongoing communication and staff training will need to address why the program exists and what its goals and objectives are; how the program will impact day-to-day roles, responsibilities and workplace activities; senior management support and participation; and general expectations of staff.

With increased energy awareness, staff behaviours will begin to change which will work to help the organization reduce overall energy use and energy-related costs over time.

Action	Energy training & awareness
Status	Building operators attend technical training related to new systems and on-line energy tracking. The Employee Environmental Education Internal Advisory team continues to provide input on programs and initiatives to integrate sustainability into the core culture of the organization.
Next Steps	Continue to determine, and offer, training relevant to building operations staff. Continue to communicate to staff, visitors and residents on energy management and performance. Determine opportunities to reinforce a culture of energy conservation at the City of Vaughan.
Timeframe	Ongoing

10.3 Energy Communication Plan

Successful implementation of the Conservation Demand Management Plan will require a strategic and staged energy awareness supported by a cohesive internal communications plan. This communications plan will highlight the steps that municipal staff can take to contribute

towards energy conservation while working to help foster an organization-wide culture of energy efficiency, energy cost-effectiveness and environmental stewardship.

10.3.1 Foster Senior Management Support Energy Leadership

One of the most important elements for the successful implementation of the Conservation Demand Management Plan and associated energy awareness and internal communications plan is commitment to the program by senior management and middle management. Top managers must not only be made aware of the need for increased energy efficiency and energy cost-effectiveness but also must be afforded the opportunity to take actions to champion energy efficiency at the top levels of the organization, thereby setting an energy leadership example for the broader staff base to follow.

10.3.2 Create an internal Energy Conservation & Demand Management Team

Not all the talent and expertise necessary for a successful Conservation Demand Management program will reside with one person or one discipline. As such, a successful CDM plan and program will require the technical knowledge and expertise of a variety of individuals from a variety of departments working together as part of an internal Energy Conservation & Demand Management Team. This team will provide the necessary technical energy management expertise. The team will also work to guide the activities of the CDM plan, integrate energy management policies and initiatives into various City departments, and communicate the City's energy initiatives, energy use, and energy cost savings to all organizational levels.

The members of the internal Energy Conservation & Demand Management (CDM) Team, as outlined in 2.4.3 will work with the Employee Environmental Education Internal Advisory Team, with respect to initiatives targeting employees.

10.3.3 Design and implement the Energy Communications Plan

Communicating the CDM plan and program to staff will involve the joint efforts of the City's senior management and the internal CDM Team. The internal CDM team will seek the advice and insights of the Corporate Communications Team and leverage the existing mechanisms (Jostle, internal newsletters such as the Environmental Sustainability Office's quarterly newsletter). The design and implementation of the Energy Communications Plan will involve:

- Consulting staff to help develop program content
- Developing key messages
- Identifying and highlighting desired behaviour changes
- Leveraging motivational incentives and award programs
- Leveraging all existing internal communications channels
- Identifying and trialing new, creative communications and engagement tactics

- Developing a timeline or schedule for the development and implementation of the communications plan
- Producing appropriate and targeted promotional materials and visuals (including real-time energy data displays) and conducting engagement activities

10.4 Highlight and Evaluate the Achieved Results

The program's achievements and effectiveness will be evaluated based on feedback gathered through staff surveys, results analysis, and ongoing dialogues with City staff. Pilot project successes, actions and achievements will be highlighted and catalogued as best practices. Energy use and cost savings will be documented and results will be reported and built upon.

10.5 Review and Revise to Improve the Process

The program will be reviewed and revised as part of a cyclical and ongoing effort for continuous improvement. Upon tracking and analyzing data and measuring progress, actions will be reviewed and revised as necessary to achieve the desired program results. If the achieved results are not as expected, new ideas and opportunities will be sought to enhance the strengths and minimize the weaknesses of the CDM program. New suggestions will be sought and the most promising ideas and opportunities will be implemented. Goals will be revised as necessary to achieve the desired outcomes. When needed, new staff talent and skill sets will be fostered.

10.6 Measurement and Verification

The energy management efforts under the Conservation Demand Management plan would not be complete without monitoring, measurement and verification to validate the staff time, internal efforts and budget invested to achieve energy use reductions and energy cost savings. Such monitoring and measurement will help to determine which energy management initiatives were effective in contributing towards the organizational goals and therefore should be replicated; which initiatives were counterproductive or ineffective and therefore should be avoided; which goals and objectives were overly ambitious; and which ones could be improved upon and strengthened.

This measurement and verification will be achieved through regular monitoring of energy usage and energy cost savings generated from energy management projects, including significant renovations, retrofits, and other facility or process improvements, and tracking observed operational and behavioural changes and improvements.

The measurement and verification of the CDM plan will be based upon the scope of each corresponding energy management and efficiency project. It will rely on the energy metering efforts discussed in section 4.1.

10.7 Reporting and Feedback

Upon tracking energy usage and energy cost savings through the measurement and verification process outlined in section 10.6, final reporting and feedback will be required to close the project loop by putting the energy management information into a form that will enable

ongoing control of energy use, the achievement of energy reduction progress and targets, and the verification of energy use and cost savings.

Energy reports and project feedback will be provided to the necessary stakeholder groups both internally and externally on a regular basis.

The following reports may be generated:

Report	Timeframe
Summary of annual energy consumption and GHG emissions as required by O.Reg 397/11	July 2014 and every year thereafter
Energy conservation and demand management measures as required by O.Reg 397/11	July 2014 and every 5 years thereafter
Council update reports	Annually – ongoing
Energy dashboard / performance indicators	Annually – ongoing
Stakeholder level custom reports	As required

11. FINANCIAL CONSIDERATIONS

This section provides an overview of the incentives currently available to support the implementation of energy conservation activities.

11.1 Incentives

Several external incentive programs exist to support the implementation of energy conservation and efficiency measures. Ontario Power Authority (SaveOnEnergy), Enbridge and NRCan (ecoEnergy) all have various forms of incentives.

SaveOnEnergy

	Prescriptive	Measures Engineered and Custom Measures
Lighting	Per unit incentives	The greater of either, \$400/kW of demand savings or \$0.05/kWh of first year electricity savings
Non-lighting Including Lighting Controls	Per unit incentives	The greater of either, \$800/kW or \$0.10/kWh of first year electricity savings

Enbridge- Enbridge helps fund workshops and seminars and provides access to technical information that can help consumers improve their energy efficiency and save natural gas. In addition, rebates and incentives are available for space heating, water heating and engineering projects.

NRCan- At this time, NRCan does not offer any grants or incentives directly related to energy savings. However, a portfolio of information tools and training are available to further support energy efficiency efforts. This can be a useful asset for the operations staff training component.

11.2 Funding of Energy Projects

If all the energy retrofit measures identified for City facilities through the energy audit process were implemented, the total 2013 estimated cost would be \$4,173,900.

12. ENERGY CONSERVATION AND DEMAND MANAGEMENT PLAN IMPLEMENTATION

The Energy Conservation and Demand Management Plan identifies actions to support the City of Vaughan towards achieving its vision, goals, objectives and targets over the next five years. Implementing the CDM Plan requires organizational commitment, as well as responsibility regarding managing the implementation process.

The City of Vaughan's Conservation Demand Management Team will take responsibility in the CDM Plan implementation and revision.

As a living document, the CDM Plan will be periodically reviewed by the Conservation Demand Management Team to consider several external and internal factors. We propose scheduling annual periodic reviews, as well as any time when relevant changes require it, in order to effectively address continuous improvement opportunities. These actions will be inserted into various Work Plans and Business Plans.