

Markham Energy Conservation Office



MECO Report – Year in Review

Prepared By: Viive Sawler,
Manager, Markham Energy Conservation Office

Date: Friday, March 9, 2007

MECO Report – Year in Review

Table of Contents

Table of Contents.....	2
Executive Summary	3
Introduction	5
Background.....	5
Program Highlights	7
Cool Shops in Markham	7
Next Steps	8
MECO@Work and MECO@Home Employee Awareness Program	10
Next Steps	11
Better Buildings Partnership	13
Next Steps	16
Energy and Environmental Management System (EEMS)	18
Next Steps	18
Advancing High Performance Buildings	19
Next Steps	20
Combined Utility Metering	21
Additional Programs Developed for the MECO Portfolio.....	22
Haul Away Your Energy Hog Appliance Retirement Program.....	22
Seasonal LED Light Exchange Program	23
Conclusion	24
Appendix A - MECO ScoreCard.....	26
Appendix B - Financial Summary.....	27

Executive Summary

The Markham Energy Conservation Office (MECO) was established in May of 2005 with funding support from PowerStream, and a vision to position the Town of Markham as a municipal leader in energy conservation. The Town recognizes that energy conservation will help save money, decrease electricity demand, enhance the local energy supply by reducing its dependency on the grid, and best of all contribute to reducing greenhouse gas emissions.

MECO is responsible for leading, developing and implementing energy conservation programs that deliver realistic demand shedding and cost avoidance results and are in line with the Provincial goals of creating a 'culture of conservation.'

For the purpose of this Report, the MECO programs and initiatives that have been undertaken over the last year are highlighted along with a general description of some of the proposed next steps. A Scorecard is included in Appendix A that details the results and measures used for each of the Programs and also makes note of current Program status and a Financial Summary is included in Appendix B. While the quantitative results, particularly, the energy saved including, electricity, gas and water, will be key in evaluating the MECO Programs once implementation of the larger initiatives is further underway, there are many other important benefits that may be more difficult to assign a value to but should not be discounted. For example, these include the leadership effort alone that the Town has shown through establishing MECO. The marketing, promotion and branding of MECO's vision and goals has been instrumental in terms of raising the MECO profile and providing education and awareness to Town staff, residents, local businesses and the community as a whole.

The original MECO programs include; Cool Shops, [MECO@Work](#) and [MECO@Home](#) Employee Awareness, Better Buildings Partnership, Energy and Environmental Management Software (EEMS), Advancing High Performance Buildings, and a Combined Metering Pilot. These programs were launched at varying times over the last year and in addition, two new programs, including the Haul Away Your Energy Hog Appliance Retirement Program and the Seasonal LED Light Exchange were launched under the MECO portfolio as well.

The electricity savings to-date come namely from the Cool Shops and Appliance Retirement Programs. Cool Shops was the first MECO program to be launched in the summer of 2005 and the results of this program to-date have been substantial, including a combined electricity savings of 202,500 kWh for over 580 small retail shops in Markham just by replacing 1285 incandescent light bulbs with compact fluorescent lights (CFLs).

The Haul Away Your Energy Hog Appliance Retirement Program, a partnership initiative between MECO, Mission Green and PowerStream delivered some

tremendous results. A total of 1321 appliances were collected, including 845 fridges, 411 freezers and 65 window air conditioners. Assuming these are secondary appliances that are not going to be replaced, the electricity savings to the grid represents just over 1,400,000 kWh, which translates into a reduction of approximately 1006 tonnes of CO₂ emissions.

The other programs, namely the Better Buildings Partnership initiative is expected to deliver the most significant energy savings. An energy audit of Milliken Mills Community Centre was conducted in the summer of 2006 and implementation of retrofit projects is planned for 2007. Anticipated savings include over 375,000 kWh of electricity and 175,000 m³ of gas. The plan for 2007 is to roll out a much more comprehensive program for key facilities and assets that are high energy consumers and implement retrofit and renewal opportunities that will yield significant energy savings.

In conclusion, there are many exciting opportunities for the Town to continue to demonstrate its leadership position in energy conservation. MECO in partnership with other Town departments and PowerStream continue to dialogue on innovative initiatives that offer potential opportunity to yield more savings. These programs will be implemented as they are developed.

Introduction

Energy conservation starts within the community and shows that the wise use of resources is good for the environment, makes economic sense and secures a healthy future for our children and future generations. Markham has a current population of approximately 275,000 and is expected to grow to 350,000 by 2026. Maintaining and improving the quality of life in the Town requires the more efficient use of finite resources, and protection against rising impacts on the environment. The establishment of the Markham Energy Conservation Office (MECO) seeks to address many of these concerns by delivering programs that will assist Markham Town Staff, local businesses, residents and the local community to implement energy conservation initiatives.

Markham aims to create a leadership example for municipalities across the country by promoting energy and resource conservation, encouraging the development of a sustainable community that is more energy efficient and that will result in reduced greenhouse gas emissions. In addition, Markham's efforts will enhance our local energy supply and reduce our traditional dependency on the electricity grid. In summary, MECO is an important environmental initiative that has been established to improve air quality, conserve resources and raise public awareness that conservation starts within the community and that individuals, can make a difference by changing their day-to-day attitudes and behaviours.

Background


In 2005, the Town of Markham made a commitment to conservation demand management and energy efficiency by establishing the Markham Energy Conservation Office (MECO) with funding support from PowerStream. The development of MECO is an important environmental initiative that has positioned Markham as a municipal champion in energy conservation. The partnership between MECO and PowerStream will see \$1 million over three years allocated to conservation demand management programs.

In October 2005, the position of Manager, MECO was filled. The role of this position is to ensure that MECO meets the objectives that have been aligned to the Province's conservation culture in determining energy reduction goals. The Manager is responsible for leading, developing and ensuring that the programs approved initially under the MECO umbrella as well as new initiatives as they are developed, are implemented in a timely manner and achieve demand shedding and cost avoidance targets.

The six originally approved MECO programs include; Cool Shops, MECO@Work and MECO@Home Employee Awareness, Better Buildings Partnership, Environment and Energy Management Software (EEMS), Advancing High Performance Buildings and a Combined Utility Metering Pilot. New programs

that have been initiated during the year include the Haul Away Your Energy Hog Appliance Retirement program and a Seasonal LED (SLED) light exchange program. All of these initiatives are intended to contribute in part to increasing energy efficiency by reducing energy consumption, encouraging the use of alternative sources of energy, and raising awareness about how to conserve, all of which are important goals in addressing environmental quality issues and reducing greenhouse gas emissions.

**INTRODUCING
COOL SHOPS**



The Clean Air Foundation's Cool Shops program helps small commercial businesses save money while reducing energy consumption and greenhouse gas emissions.





- 1 The Free Benefits** You will receive free Energy Star® qualified Compact Fluorescent Bulbs, free LED exit sign bulbs, and a free Energy Use Assessment.
- 2 Discounted Products** Direct access to significant discounts off energy-efficient products.
- 3 We Help Promote Your Business** Get free local advertising and in-store signage.

BENEFITS

- ✓ Save money on your monthly energy bills
- ✓ Enhance comfort level and look of your store
- ✓ Increase community profile
- ✓ Reduce air pollution and chance of electricity blackouts

For more information and other energy-saving tips, please visit www.coolshops.ca or call 905.477.7000 ext 2350

cleanair FOUNDATION Another successful Clean Air Foundation Program, Cool Shops has visited over 7,000 small commercial businesses across Ontario to date.

Program Highlights

Cool Shops in Markham

Cool Shops, a partnership program with the Clean Air Foundation and delivered in Markham by MECO, is a market transformation initiative targeting street-facing retailers. The purpose of the program is to identify and implement in-store energy management measures that encourage the small-business commercial sector to save on utility costs and reduce energy consumption. To-date, approximately 202,500 kWh of electricity has been saved collectively by 586 participating Markham Cool Shops.

Launched in Markham in the summer of 2005, Phase I of the *Cool Shops* program, was designed to identify appropriate energy savings measures for each retailer by conducting an energy audit that focused on lighting and included the installation of a free compact fluorescent light bulb (CFL) as well as direct access to discounts on energy efficient products such as CFLs, LED "Exit" sign bulbs and programmable thermostats. Over 500 retailers participated, resulting in a combined savings of 83,000 kWh of electricity just

by replacing one incandescent bulb with a CFL. This translates into a cost savings of approximately \$8,300 across all participating retailers (at \$0.10/kWh).

Phase II of the *Cool Shops* program was officially launched in February 2006 whereby MECO began offering businesses a complete change-out of their incandescent light bulbs with free CFLs provided by PowerStream. A pilot with 11 local businesses was initiated in February with a media launch at the Queen's Pantry in Unionville and a total of 319 incandescent bulbs were converted to

CFLs. The total energy saved was 53,000 kWh/year which equates to approximately \$5,300 (at \$0.10/kWh) in costs savings. MECO is continuing to offer this program to small businesses in Markham and is promoting the opportunity through the Markham Board of Trade and the Markham Small Business Enterprise Centre. In addition to the 11 businesses that participated in the pilot, MECO has provided a complete change-out of 425 incandescent bulbs to CFLs for 34 more businesses resulting in a combined savings of 66,500 kWh, or approximately \$6,650.

Additional product offerings including energy efficient Par38 and BR30 bulbs that are made available as well to Markham businesses through discounts provided through MECO. While the uptake has not been immense, 35 Par38s and 5 BR30s have been purchased through this discount program.

MECO also assisted in promoting the Enbridge Spray 'N Save program to Markham businesses, primarily restaurants and other food service establishments that use hot water for rinsing and dishwashing. Enbridge provided the free installation of a low-flow, pre-rinse spray valve that on average saves \$546 per year in gas and \$630 in water and sewage costs per operation based on a daily usage of approximately 4 hours. There were 45 Markham businesses that participated, resulting in a combined cost savings of approximately \$24,570 in gas and \$28,350 in water.

MECO has also participated in various community events; including a PowerStream launch of the Every Kilowatt Counts campaign at Home Hardware in Markham; Unionville Festival; Markham Village Music Festival and the Markham Fair. While MECO handed out free CFLs on behalf of PowerStream at many of these events, literature was also made available on the Cool Shops Program.

Finally, during the summer months, MECO also worked with We Conserve (Conservation Council of Ontario) to promote the Doors Closed program to Markham businesses participating as a Cool Shop. This program aimed to encourage businesses that were running their air conditioning in the summer months to not waste money or energy by having their doors kept open at the same time.

Next Steps

Given the detailed data that has been collected on Markham Cool Shops – MECO is well positioned to offer additional programs to assist small businesses save money through energy efficiency. Currently discussions are underway with PowerStream to determine the next phase of an appropriate small commercial business program in Markham that may incorporate a number of measures to reduce electricity consumption as well as gas and water consumption. One idea may include offering energy audits to small commercial businesses that go

beyond lighting retrofits and focus on cooling or refrigeration issues. Another idea would be to explore the benefits of carrying out a freezer coil cleaning pilot for businesses such as small grocery, convenience or restaurant establishments that have freezers. MECO and PowerStream have had some preliminary discussions with other organizations, including GreenSaver and the Clean Air Foundation, both not-for-profit organizations that may be included in the delivery of such programs. An opportunity exists as well to formalize a partnership with Enbridge Gas Distribution to further promote their Spray 'N Save Program to full service restaurants and other food service operations that will assist in conserving gas and reducing water consumption through the installation of low-flow pre-rinse spray valves.

MECO@Work and MECO@Home Employee Awareness Program

MECO launched the MECO@Work and MECO@Home Employee Awareness Program on November 2, 2005 with the “Turn Off & Save” sticker campaign to remind employees to turn off their computers, monitors and task lighting when not in use and at the end of the day. The MECO@Work and @Home program promotes MECO’s purpose and brand across the Town by encouraging staff to engage in energy conservation at work and at home. While at work Town staff is encouraged to change their energy consumption patterns and bring the culture of conservation into their homes with the help of new and innovative energy saving tips and products.

Throughout the year, MECO has held five Lunch & Learn events for Town staff on a variety of energy and water conservation topics. Many other information and awareness raising activities are also organized on a regular basis. A MECO webpage was launched on the Markham website (www.markham.ca) in January 2006, bi-weekly tips on energy conservation were distributed on our intranet, articles and advertisements were published in various sources and other larger education and awareness events were held throughout the year. Examples include, the *MECO Energy Conservation Open House* that was held in April at the Civic Centre, in partnership with York Region’s *20/20 The Way to Clean Air Program*. Over 110 staff attended and picked up literature and spoke with various exhibitors who were offering information on energy conservation products, programs and services. PowerStream was on hand to provide free CFLs to each participant who resided in their service territory. In the summer, MECO hosted a *BBQ* for Town staff to raise awareness about MECO and to highlight some of the projects that the office has been undertaking. Close to 200 staff members attended this event and the first issue of the ***MECO Newsletter*** was also launched on this day. In December, MECO, along with various other Town departments held a “*Celebrate the Season – Think Green*” event in the Civic Centre. MECO, Markham Environmental Sustainability Fund (MESF), Mission Green, Smart Commute and Friends provided some holiday cheer, tips on 'Eco-Giving' and saving money, energy and our planet. An eco-basket filled with energy efficient products was given out as a grand prize – all those who registered were eligible to enter the draw.

MECO has been circulating a ‘Watt Reader’ to Town Staff that they can take home with them to monitor the energy consumption of various appliances. When a Watt Reader is connected to an appliance, it will monitor and determine the number of kilowatt-hours used over a certain number of hours. It is then possible to calculate the cost of operating that appliance by comparing it with the monthly hydro bill. The benefit of this device is that it gives people an idea of how much electricity various appliances use in their homes and thereby will hopefully encourage them to be more conscientious about turning them off when not in use. To-



date, about 50 staff members have signed the Watt Reader out. In addition, MECO, in partnership with Markham Public Libraries (MPL) and PowerStream, held a launch of the Watt Reader program at the Unionville Library in the fall to make the program available to Markham residents who can then sign a Watt Reader out from their local library. PowerStream provided 98 Watt Readers for circulation across MPL and to-date, they have been signed out 481 times.

Finally, MECO also promoted an “Energy Conservation Challenge” to Town employees through the Ontario Clean Air Alliance’s Go Clean and Green Challenge – www.gocleanandgreen.org. Flyers for this challenge were distributed through our Community Centres and Contact Centre desks for the public and were promoted through our MECO@Work and MECO@Home literature via the intranet to Town staff. About 25 staff members participated and each month participants were eligible for prizes such as free compact fluorescent light bulbs and LED book lights.



Next Steps

MECO plans to continue with organizing various Lunch & Learns and other events for Town staff. In the longer term, MECO is also considering a public display that could be positioned in the Great Hall of our Civic Centre or displayed at our various community centres. This display could be a ‘fixed’ display or an interactive kiosk - basically a computer terminal with a touch screen that can be programmed with information that would be interesting to staff and/or the public. The intent would be to feature MECO initiatives and promote the highlights of some of the energy savings opportunities underway. Not only would this be targeted to Town staff but also to the public that visits our community centres and other public buildings. For instance, once implementation of energy savings

opportunities is underway at the Milliken Mills Community Centre, these retrofits can be promoted on a display board or kiosk and stationed at Milliken or moved around to other locations as well.

Another opportunity for the Employee Awareness initiative would be to look at developing a specific energy conservation challenge program for all Town Staff. While the Go Clean and Green Challenge encouraged staff to participate – it was an initiative of the Ontario Clean Air Foundation and other than encouraging people to sign-up – unless they notified us that they did, we had no way of tracking their conservation measures, nor the impact of their savings.

MECO is also interested in potentially spearheading the organization of a large community event to feature energy conservation initiatives, green energy alternatives, and/or other environmental programs and activities that the Town of Markham is leading. This idea is subject to discussions with other Town departments and approval from Senior Administration and Council. The preliminary concept includes hosting a “Green Energy/Environment Day” for the local community.

Better Buildings Partnership

The Better Buildings Partnership (BBP) is an innovative initiative being coordinated and implemented by MECO but involves close collaboration with other departments including Asset Management and Recreation. The purpose is to promote and implement energy efficiency, water conservation and building retrofit and renewal enhancements across the Town's facilities including street and traffic lighting, while reducing greenhouse gas emissions. The program involves identifying energy conservation opportunities that will consist of a mix of short and long-term paybacks but will greatly reduce energy demand on the grid and save the Town significant dollars. Building and maintaining "greener" buildings means "healthier" buildings for people to work in, resulting in less down time, happier, more loyal employees and more productivity. This is an important goal and represents an opportunity in furthering the Town's efforts to achieve the National Quality Institute's Performance Excellence Program Level II Integrated Quality and Healthy Workplace.

One of the first projects undertaken by MECO for this program was to engage Gartner Lee Limited, a local consulting firm, to develop a Decision Support Model that enables MECO to evaluate and assess benefits and costs attributable to individual conservation programs and select optimal ones based on their projected savings. It became very apparent early on, that there are multiple vendors selling energy efficient products and services and MECO needed a way to manage and screen these opportunities more efficiently. The Model uses 2005 as the baseline year and captures energy consumption, costs, savings and cash flows over a 21-year period (2005 – 2025, including 2005 as the baseline year and a 20-year forecast into the future). The Model also includes two electricity price forecasts for analyzing and assessing the impact of a specified conservation program. These include looking at the avoided costs to the Town of Markham as well as, the Total Resource Cost, as specified and approved by the Ontario Energy Board.

This tool is very helpful for evaluating one-off energy saving solutions. There are many vendors with products and technologies that make many energy savings claims and having this model allows us to do an initial screening of them. Vendors that are interested in selling their technology to the Town are required to provide MECO with various inputs including: reduction in total yearly consumption (kWh); reduction in Average Peak Demand (kW); reduction in annual Operating & Maintenance costs (\$); reduction in natural gas consumption (m3); capital costs (\$) and installation costs (\$); useful life of technology (years) and term of debt repayment (years). The Model will then evaluate the technology under two scenarios; a financial evaluation as avoided costs to the Town of Markham; and a financial evaluation under the Total Resource Cost Test.

One example of where this model is being used is in evaluating some new energy efficient lighting options that are currently being explored. Vendors have

approached the Town with indoor lighting solutions as well as retrofit ideas for existing street lighting. One project that is currently underway is a lighting retrofit of the Civic Centre's 96 fluorescent lamp fixtures in the underground parking garage. They will be retrofitted with half the number of light tubes (2 instead of 4 in each fixture) along with Parabolic Reflector Technology (PRT) that will ensure that the lighting levels will remain the same or exceed current levels despite the fact that the number of lamps will be reduced by 50%. The anticipated savings is 53,874 kWh per year and a savings of 6.14 kW on our Peak demand.

Another initiative carried out in 2006 was an energy audit of Milliken Mills Community Centre that was completed in August. The consultant's report outlines potential energy savings opportunities that Town staff from MECO, Asset Management and Recreation is considering and will undertake when the 2007 capital budget is approved in April. MECO has requested \$280,000 for implementing the proposed energy savings measures at Milliken, including Building Automation System control upgrades, a pool Air Handling Unit for heat recovery as well as a boiler replacement and some other lighting retrofits. Projected savings at Milliken Mills include: 372,000 kWh of electricity savings, 174,000 m³ of gas savings and cost savings of close to \$100,000 per year. This would mean that the retrofit opportunity would yield a simple payback of just less than 3 years.

MECO in conjunction with the Utilities and Contracts department (Asset Management) has contracted RTG Systems Corporation to undertake a Street Light Evaluation study of various residential and industrial areas in Markham that may be over lit above the Illumination Engineering Society of North America (IESNA) standard. Assuming that some areas may be over lit, there is potential to save energy by reducing the wattage of the lamps. Although there is a cost to doing the actual re-lamping which may not justify the savings achieved unless it is done during the regular re-lamping schedule. Further evaluation is required but there may be potential to revise the standard for new sub-divisions to include lower wattage lamps. At the same time, we have also been investigating various street lighting alternatives including; dimming systems, electronic ballasts, induction lighting as well as LED lights for parking lots. Potential pilot tests in partnership with PowerStream are currently under discussion and being investigated.

In addition, pilot tests and demonstration projects for other alternative energy solutions or energy savings technologies are being explored on an on-going basis. A consultant has been engaged to conduct a Sustainability Study on the Centennial Community Centre. The purpose of the study is to examine the potential to locate a greenroof, solar panel and/or other comparable technologies at Centennial and determine which technologies would provide the best overall benefits, including return on investment. This report will summarize for each technology, capital costs, the potential energy savings, potential cost savings and simple payback. In addition, other environmental benefits and tonnes of CO₂

emission reductions will be estimated. While the study is being conducted for Centennial, the information will be useful for consideration at other facilities and/or new buildings.

Another initiative that MECO coordinated with PowerStream was the installation of interval meters at selected facilities where they were not yet in place. While the benefits are not immediately measurable, access to viewing hourly consumption is advantageous to the facility operators.

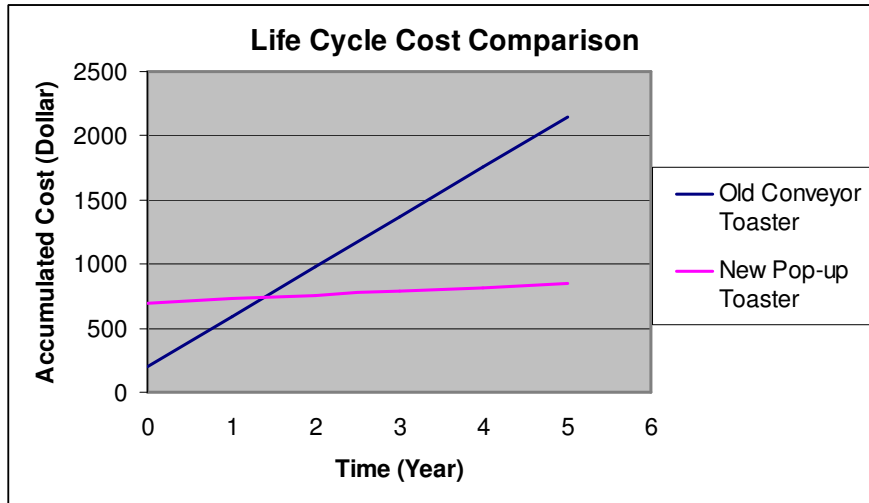
Lastly, MECO in partnership with other Town departments has implemented a few other small initiatives that despite the minimal savings, demonstrate a commitment to energy conservation and team effort.

One such example is an Energy Conservation Alert that was held on August 1st, one of the hottest days in 2006. Through our efforts, including turning off many of the Civic Centre lights, we were able to reduce our peak load by over 200 kWh of electricity on August 1 - the equivalent of shutting off 200 computers for a day! We also encouraged Town staff to do things at work such as; decrease lighting in their areas and use task lighting where needed, close window blinds, turn off computers, monitors, printers, scanners after work hours, avoid large photocopy jobs, turn off any signage and systems not necessary for operations, security or safety, and use stairs instead of elevators. At home, employees were encouraged to set air conditioners to 26 degrees Celsius or higher, or use fans as an alternative, and avoid or limit use of major power-consuming equipment such as dishwashers, washers and dryers and swimming pool pumps between 8 am and 8 pm.

After August 1st, Asset Management continued to carry out load shedding activities throughout the month of August at the Civic Centre that resulted in 1,749 kWh of electricity saved.

Another small initiative, spearheaded by Asset Management, included the replacement of an old conveyor type toaster in the Civic Centre Cafeteria. It was a 4.2 kW unit which was running four hours every working day for a maximum toasting demand of twenty bagels a day. The annual electric energy consumption was approximately 4,370 kWh. The new energy efficient pop-up toaster is a 2.7 kW unit that will take only 350 kWh energy to provide the same service. Therefore, this replacement results in an approximate savings of 4,000 kWh electricity every year.

The cost-benefit analysis goes further as the old toaster needed about \$200.00 for repair which was avoided by switching to the new unit. The new heavy duty commercial pop-up toaster cost approximately \$695.00. The following figure shows a payback analysis for this replacement. The payback period is less than 1.5 years.



Next Steps

MECO intends to continue rolling out the energy audit process at other Town owned facilities, focusing on the ones consuming the most energy to determine what are the best investments to be made in order to save the most energy and achieve a high return on investment. The audit at Milliken Mills Community Centre is being used to test the process and learn from the findings and ultimately the savings resulting from implementation. This will allow Town staff to make recommendations on how best to move forward with the other facilities.

MECO intends to continue to evaluate one-off energy efficiency opportunities through use of the MECO Decision Support Model.

MECO is also interested in pursuing opportunities to find a solution for saving energy and cost on street lights. Further discussions are needed between MECO, Utility and Contract staff as well as PowerStream to identify the opportunities that make the most economic sense and offer potential for funding support.

Another plan for 2007 is to prepare a Report to Committee to consider supporting a recommendation on adopting the Leadership for Energy and Environmental Design Standard (LEED) for Town owned buildings. LEED is a green building rating system that is a voluntary standard. It is based on a sustainable design strategy that addresses building performance and efficiency and has a profound impact on our natural environment, economy, health and productivity. LEED uses seven categories where a building can achieve a number of points based on credits which have very specific, measurable requirements. These categories include; sustainable site; water efficiency; energy and atmosphere; materials and resources; indoor environment; air quality; and innovation and design.

Whether LEED is adopted or not, it is the Town's intent to build new facilities that incorporate higher, more efficient standards. In 2007, the Ward Building at the Markham Museum is planned for reconstruction. The Town is in the process of hiring an architect to begin the design work. The scope of work outlines a description of environmental considerations and it is stated that the facility is to include green building principles within the design including consideration of the installation of a green roof, provision of alternative energy sources such as solar and geothermal, and potentially, the achievement of LEED certification.

There are new fire stations to be built over the next few years, and they will be constructed to higher efficiency standards. The next community centre to be built is in Cornell and is scheduled for 2009/2010. Discussions are underway to have this building connected to Markham District Energy. This building will of course also be built to very high efficiency standards.

It should also be noted that some energy efficiency gains will be achieved through changes to the Ontario Building Code (OBC), released in June 2006. Related to energy efficiency requirements, the 2006 OBC takes a graduated approach having started with moderate requirements for new buildings coming into effect December 31, 2006 and moving towards more aggressive measures by 2012.

Energy and Environmental Management System (EEMS)

With the purchase of the Energy and Environmental Management System (EEMS) from the Region of York, the Town of Markham is now adept at measuring current consumption patterns and load shedding impacts of energy conservation programs within the Town's own operations. EEMS is a versatile, web based software designed to record and manage energy consumption and expenses of buildings, street lights, and other types of facilities. EEMS has the capability to track electricity, natural gas, water and waste water accounts, and other fuel usage (gasoline, diesel, etc.), as well as provide analysis on utility performance. To-date, electricity, water and gas data for 2003 to 2005 have been entered for all of the Town's facilities, including street and traffic lighting.

EEMS will also be utilized to track energy consumption at the Hunt Club condominium as per the project highlighted under the Advancing High Performance Buildings Program.

Next Steps

EEMS is a tool and not an on-going 'project' that it was referred to as in the original MECO Business Plan. Hence, MECO staff will coordinate with York Region on any enhancements or improvements to the software that may be necessary over time but otherwise, the purchase of this tool was a one-time cost with the expectation that hosting fees and selected upgrades will be paid for on an annual basis. MECO has been working with PowerStream and York Region to enable the electronic upload of the electricity and water bills. A test file has recently been provided. Discussions with Enbridge are also underway to improve the efficiency of uploading the gas data to EEMS. Once the files are received, the 2006 data should be entered fairly quickly.

Advancing High Performance Buildings

The AHPB Program represents an opportunity for the Town to create a sustainable community that will lower the overall environmental load on the built environment through reduced energy consumption. The program focuses on new designs, construction and operating methods that will reduce the energy consumption of new infrastructure. Existing benchmarks will be documented and outputs will be measured from new buildings that participate in the AHPB program. Pre- and post-program performance capabilities will be identified to project future cost avoidances while reducing overall consumption. MECO contracted with the Canadian Urban Institute (CUI) to prepare a Report outlining a Framework for AHPB development. This document provides useful information with respect to potential incremental costs associated with constructing high performance buildings and options for financing.

A major development project currently underway in Markham is the development of Markham Centre, a “Downtown” core that offers residents an opportunity to live, work and play in an economically vibrant community that emphasizes sustainable development, public space, alternative energy and a higher quality of life.

Based on the principles of new urbanism and Smart Growth, Markham Centre will have a distinctly urban character, with higher density, mixed-use developments, strong streetscapes and world-class parks and public amenities. Smart Growth refers to land use and development practices that enhance the quality of life in communities and preserve ecological integrity. Smart Growth is a way of managing growth to create strong communities, a strong economy and a clean, healthy environment.

Building design in Markham Centre also follows sustainable guidelines based on the Markham Centre Performance Measures document, including energy efficient power sources and in some cases LEED certified developments. Downtown Markham also features urban design that reflects and respects the natural environment. Designed to fit into the natural beauty of the Rouge River Valley, the Town, along with developers and community representatives, work with a broad range of government ministries and independent environmental groups to ensure green building policies are properly developed and adhered to. The community's energy needs will be met with district energy, a highly efficient, low maintenance and environmentally friendly method of heating and cooling buildings and homes.

Recently, a consultant has been engaged to compare the Markham Centre Performance Measures document against LEED. MECO is participating in a Working Group of the Markham Centre Advisory Committee (MCAC) to discuss the outcome of the consultant's review and to determine how to best incorporate LEED or to build in more stringent energy efficient targets in the Performance

Measures document. In October 2006 MECO also gave a presentation to the MCAC, outlining MECO's objectives and highlighting some of the MECO projects.

Another project that MECO has undertaken in collaboration with the Town of Markham's Environmental Leadership group is to work with a local condominium corporation to promote energy efficiency. The Hunt Club recently upgraded its boilers and made some other energy efficiency improvements and was successful in obtaining some government grants towards these retrofits including a grant from the Markham Environmental Sustainability Fund. Conditions were attached to the Town of Markham's agreement to fund the Hunt Club in the amount of \$10,000 including that the Hunt Club collaborate with MECO to share information on their energy consumption and savings. They will be providing all the historical (2003 to present) and future energy data necessary, including hydro, water and gas once PowerStream and Enbridge process the request to release the data to MECO. They also agreed to promote energy efficiency and the MESF to other condominium corporations within the Town of Markham, by hosting a workshop which took place on November 17th with representatives from the Hunt Club Board of Directors, the Condominium Corporation as well as a few other local condominium corporations and Markham's Deputy Mayor, and three Markham Councilors. The Hunt Club has agreed to promote the MESF and MECO in all communications associated with the Energy Retrofit Assistance Proposal, including any communications to other levels of government related to this project and to the Hunt Club residents. This initiative will be used to showcase private sector examples of leadership in energy efficiency.

Next Steps

The Town of Markham is already highly committed to ensuring sustainable growth, demonstrated by the efforts and the development that is already occurring within the Town, particularly Markham Centre. While MECO's interests are represented in the Working Group of the Markham Centre Advisory Committee (MCAC), the goals of this particular project as it relates to the MECO portfolio need to be examined and perhaps re-defined.

As mentioned under the Better Buildings Partnership program, the Ontario Building Code was recently amended and the changes will impact the work and direction that this project takes on. For example, some of the changes that will impact residential development to yield energy efficiency improvement gains will be achieved through increased insulation requirements for foundation walls, above grade walls, ceilings and windows; requirements for the installation of high-efficiency gas or propane-fired furnaces; and in the longer term, listing EnerGuideTM 80 as a compliance alternative.

Combined Utility Metering

This project was one of the six original MECO programs outlined in the MECO Business Plan. The Combined Metering Pilot was specific to Remington Town Homes, a development to be connected to district energy at the Markham Town Centre location. The purpose of the Pilot was to bring together data from gas, water, electricity and district energy meters into one presentation format that would be accessible to the residents and would assist them in making conservation decisions. The data generated would come from smart meters for electricity and the latest metering technology being deployed by the gas, water and district energy utilities.

MECO contracted Util-Assist to prepare a report on options for effectively educating end users on their energy consumption habits. All service entities (electric, water, gas and district energy) would be included. While multiple technology solutions may be available, the focus was on web presentment. Presenting data to residents in web format would not be intended as a billing mechanism. Rather it would simply present current and past consumption records (kWh, litres of water, cubic meters of gas, thermal energy), and, potentially, comparisons with the median consumption patterns of others connected to the same system. This project has had to be temporarily delayed while the Remington Town Homes are being built. Occupancy is planned for 2008 at which time the Program will be revisited.

Additional Programs Developed for the MECO Portfolio

Haul Away Your Energy Hog Appliance Retirement Program

**HAUL AWAY YOUR ENERGY HOG
AND SAVE MONEY**

Energy Fact:
Don't keep that old, inefficient refrigerator running in the basement for occasional refreshments. It could cost you \$50 or more per year in electricity.

Between November 1, 2006 and March 1, 2007, Markham is sponsoring a retirement program for select appliances. We will collect and recycle your old, inefficient refrigerators, window air conditioners and freezers from inside your home free of charge
(Some conditions apply)

This program is a Mission Green and Markham Energy Conservation Office (MECO) initiative

Call 905-415-7535 to book a collection appointment
www.markham.ca

PowerStream
YOUR CURRENT CONNECTION

powerWISE

MARKHAM

Starting on November 1st, Markham residents had great reason to unplug their old refrigerators, freezers and window air conditioners: MECO in partnership with Mission Green and PowerStream launched a program for Markham residents to allow for the collection of old refrigerators, freezers and window air conditioners from inside homes, free of charge, until March 5, 2007.

The Town of Markham's "Haul Away Your Energy Hog" not only saved residents the effort of moving these units to the curb, it saved them the \$10 pick up

fee, and money they would have spent on powering the appliance – which can cost hundreds of dollars each year. The program was a huge success with the collection of 1321 appliances including; 845 refrigerators, 411 freezers and 65 window air conditioners removed from peoples' homes. Assuming these old appliances are secondary appliances that are not being replaced, 1,428,295 kWh of electricity will be saved annually which translates into an approximate reduction in CO₂ emissions of 1006 tonnes. In addition, the residents that did participate in this program received an information package on energy efficiency tips for the home and purchasing energy efficient products. They also received one free compact fluorescent light (CFL). The calculation for the kWh savings for every CFL given out has not been calculated here.

Seasonal LED Light Exchange Program

In November, MECO and Mission Green in partnership with PowerStream offered a Seasonal LED (SLED) Light Exchange Program to residents of Markham through the Markham recycling depots. Residents were invited to bring in one old string of incandescent lights in exchange for a string of energy-efficient seasonal LED lights. 1500 strings of SLEDs were handed out and many more incandescents returned that were collected and recycled where possible. Seasonal LEDs use up to 95 percent less electricity than their incandescent counterparts. They last 100 times longer and since they are not made with glass or filaments, SLEDs are less prone to breakage. They also produce minimal heat, making them less of a fire risk. While this program was a success and all 1500 strings were given out in less than a few weeks, the Province issued a recall of these lights due to safety concerns. However, new strings made by a different vendor were provided in a timely manner by PowerStream for residents who participated in the initial exchange program.



PowerStream Seasonal LED Lights Exchange Events

Exchange your old strings of incandescent holiday lights for strings of energy-efficient seasonal LED lights at the locations and times indicated below.*

Vaughan Sunday, November 12 - 3:00 to 6:00 p.m. The Sports Village, 2600 Rutherford Road Saturday, November 18 - 1:00 to 3:00 p.m. Al Palladini Community Centre 9201 Islington Avenue	Aurora Wednesday, November 29 - 5 to 8 p.m. Aurora Town Hall 1 Municipal Drive
Richmond Hill Sunday, November 19 - 12 to 4:00 p.m. Hillcrest Mall (west parking lot near GoodLife Fitness)	Markham <i>(for Markham residents only)</i> November 1 - November 30 Call 905-415-7535 for locations and details

* While quantities last. Maximum two strings per household in Aurora, Richmond Hill and Vaughan. Maximum one string per household in Markham













Conclusion

In summary, during the first year of MECO's operation, many exciting activities and initiatives have been undertaken. Cool Shops was the first MECO program to be launched and the results of that program to-date have been good considering the focus has just been on replacing incandescent light bulbs with compact fluorescents.

The MECO@Work and MECO@Home Employee Awareness program has also been a success and sets the stage for many more opportunities to deliver education and awareness raising opportunities for Town Staff.

The Better Buildings Partnership initiative is the program that will ultimately deliver the most energy savings for the Town, however, the development and delivery of this program has been behind some of the other MECO initiatives due mainly to the complexities of rolling out a program of this size and nature. There are many opportunities for Town owned facilities but significant time and effort is required in terms of identifying the best opportunities that will yield the greatest savings and make the most economic sense. In addition, time has been spent building relationships across departments as well as managing an influx of energy efficiency program and technology proposals that all need to be screened and evaluated before they are ultimately pursued. Once the larger initiatives are underway, however, measuring and monitoring results will be a priority in order that reporting on the successes can be carried out in a timely manner.

The Advancing High Performance Building Program offers great potential for improving the way buildings are constructed within the Town and how further growth and development is handled. However, as described in the Program Highlights section, MECO's role in this initiative needs to be re-examined and perhaps re-designed. Markham has shown a leadership role in the vision and planning that has taken place around the development of Markham Centre. While MECO seeks to contribute value in the process where and when appropriate, i.e., through participation in the Markham Centre Advisory Committee's Working Group, the targets and goals for measuring MECO's success in this area of its portfolio needs to be re-evaluated.

Beyond the initial programs that MECO set out to launch and deliver that were described in the original Business Plan, MECO has had the opportunity to create additional programs as well, including the very successful, Haul Away Your Energy Hog Appliance Retirement Program. This program saw the collection of 1321 appliances, including 845 fridges, 411 freezers and 65 window air conditioners. This translates into approximately 1,428,295 kWh removed from the grid, assuming these are secondary appliances that are not replaced, and a reduction in CO₂ emissions of 1006 tonnes. In addition, MECO in partnership with Mission Green and PowerStream offered a Seasonal LED light exchange

program to Markham residents during the month of November through the Markham recycling depots.

MECO is keen to continue working towards achieving energy reduction and cost saving goals through its existing programs as well as launching new programs that would contribute to increasing energy efficiency within the Town and that make economic sense. MECO looks forward to continuing its partnership with PowerStream and working towards developing and delivery successful energy conservation programs. In addition, one of MECO's longer-term goals is to broaden the success of its portfolio of programs and grow its profile even further, both to internal and external stakeholders within the Town of Markham.

Appendix A - MECO ScoreCard

Appendix B - Financial Summary