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ANNUAL ENERGY REPORT 2005

The Finance and Administration Committee recommends the adoption of the recommendation contained in the following report, April 19, 2006, from the Commissioner of Corporate Services:

1. RECOMMENDATION

It is recommended that:
This report be received for information.

2. PURPOSE

This second annual report outlines progress and outlook on York Region's Energy Management Program.

3. BACKGROUND

As a municipality and as a large energy consumer, York Region is in a position to demonstrate leadership in energy conservation and environmental protection.

In recent years, there has been a renewed interest in energy for a variety of reasons: notable increases in utility prices, a rising concern about future supply and reliability in the face of rapidly growing global demand, and increased public awareness regarding the environmental consequences of generation and use. It is not likely that these circumstances will change appreciably in the near future.

These and other "drivers" led to York Region's decision to commence the Energy Management Program, led by Property Services, in early 2003. This specialized program is comprised of York Region employees who are engineers and business professionals focused on three pillars of energy management:

- Corporate Energy (Benchmarking, Procurement, etc.)
- Sustainable Buildings (High Performance Retrofits/Design, LEED® Certification)
- Clean Air (Emissions Accounting, Corporate Clean Air)

The Energy Management Program's primary focus is to identify cost-cutting initiatives across Regional buildings and operations.

3.1 Region's Utility Profile

Given York Region's growth, size and scope of business, it is no surprise that York Region is a large consumer of energy. The Region consumes energy in different ways: to heat and cool buildings, to drive large pumps, motors and treatment processes at water and wastewater plants, to power street and traffic lights, and to fuel vehicles (e.g. fleets) and buses.

The Region's energy use continues to grow in concert with increased demand for Regional services. On a corporate scale the Region's utility expenditures in 2005 exceeded \$15 Million.

Electricity costs are the largest component of the Region's energy bill, with roughly 60% of those costs derived from water and wastewater pumping and treatment (Figure 1).

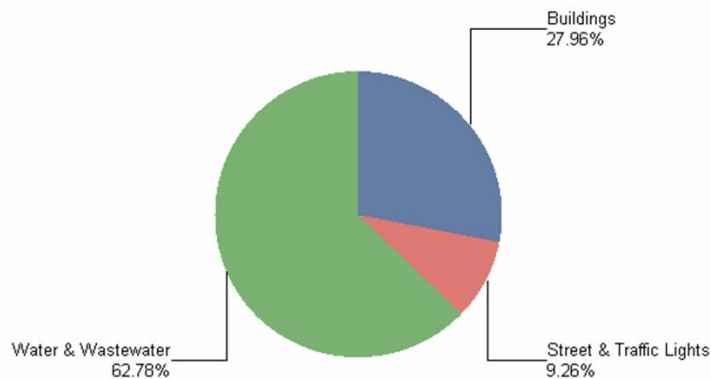


Figure 1. Distribution of Electricity Costs by Facility Type, York Region, 2005 (Source: Energy and Environmental Management System)

The breakdown between commodity and distribution costs for electricity depends on the rate classification (e.g. >50kW demand) and size of the load. For a typical water and wastewater facility the breakdown is presented below (Figure 2).

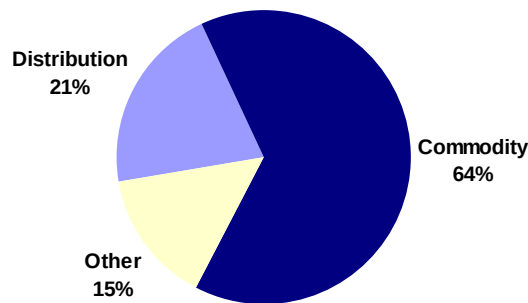


Figure 2. Electricity Distribution and Commodity Costs of a Typical Water and Wastewater Facility, York Region, 2005 (Source: Energy and Environmental Management System)

Natural gas consumption, primarily used for heating buildings, is also on the rise as the Region occupies new space. Consumption grew approximately 8% from 2,381,225 m³ in 2004 to 2,571,269 m³ in 2005.

3.2 Market and Regulatory Update

3.2.1 Electricity

In 2005, the Province introduced the terms and prices of the Regulated Price Plan (“RPP”) and designated municipalities as a particular class of consumers – “Eligible Consumers”. Ontario determines electricity prices under a “hybrid” scheme which includes regulated prices, contract prices and spot market prices, combining to establish an overall market cost of electricity. The purpose of the RPP is to apply this market cost to “eligible consumers” in a way that is predictable and reduces volatility.

Through the RPP the Region pays a two-tier regulated price for electricity. Commencing April 1, 2005, the commodity price paid by the Region was 5.0 cents/kWh for the first 750 kWh consumed monthly and 5.8 cents/kWh for electricity consumed over this amount. Given that most Regional accounts consume far greater than 750kWh per month the effective rate is 5.8 cents/kWh.

Starting May 1, 2006, the RPP prices will increase 16% to 5.8 cents/kWh for the first 750 kWh consumed monthly and 6.7 cents/kWh for electricity consumed over this amount. The Province will also introduce time-of-use pricing starting May 1, 2006, which will take effect for utilities that have both systems and meters capable of tracking and reporting hourly electricity use and have implemented TOU pricing (On-peak = 10.5 cents/kWh, Mid-peak price = 7.5 cents/kWh, Off-peak price = 3.5 cents/kWh).

In addition to commodity prices, distribution rates are also increasing effective May 1, 2006. In York Region there will a distribution rate increase of 6 – 12 % with Hydro One,

no rate increase with Newmarket Hydro and a rate increase with Powerstream to be determined in late April 2006.

All “eligible consumers” are eligible for the RPP until April 2008. After 2008, only residential consumers and general service customers having less than 50kW demand will be deemed “eligible consumers”. This means starting in April 2008, municipalities will be fully exposed to electricity market prices, similar to the deregulation period in 2002.

The Ontario Regulation 653/05 made under the *Municipal Act, 2001* permits municipalities to enter financial agreements for the purpose of hedging commodity prices for commodities used in the normal operation of the municipality. This is a tool to help protect against price increases and add stability to the budgeting process.

3.2.2 Energy Conservation Responsibility Act, 2006

On November 3, 2005, the Minister of Energy introduced Bill 21, the “Energy Conservation Responsibility Act” (“Bill 21”). A component of Bill 21 is the “Energy Conservation Leadership Act” (“ECLA”). ECLA creates a variety of conservation measures that will apply to public sector entities under the ECLA in order to further energy conservation. The ECLA received Royal Assent on March 28, 2006.

Under this legislation, the Region is required to prepare and publish periodic energy conservation plans, implement such energy conservation plans, achieve prescribed energy conservation targets, and consider energy conservation and energy efficiency when making capital investments or acquiring goods and services. The ECLA specifies that the energy conservation plans should include the current and proposed conservation activities and measures and any progress and achievement in energy conservation or reduction since the publishing of a previous plan.

3.2.3 Standard Offer Program

The Ministry of Energy has established a Standard Offer Program. Municipalities are eligible for this program, which provides a premium price for small renewable energy projects (<10 MW) for a fixed term (20 years). The forms of renewable energy include wind, solar, renewable biomass, bio-gas, bio-fuel, landfill gas and water. The base price for all qualifying projects other than solar photovoltaic will be 11 cents/kWh. For solar photovoltaic, it will be 42 cents/kWh.

The Standard Offer Program provides an opportunity for the Region to increase its energy self-sufficiency through development of renewable power sources. It would specifically enhance the business case of a “behind the meter” wind energy project currently under review at the Sutton Water Pollution Control Plant in Georgina.

4. ANALYSIS AND OPTIONS

The following sections highlight major achievements to-date and initiatives slated for 2006, within the Energy Management Program.

4.1 Corporate Energy

The Corporate Energy area achieves cost efficiencies in the way the Region buys, uses, measures and saves energy. York Region has many exciting initiatives currently going on in this area as outlined below.

Energy and Environmental Management System (EEMS):

- York Region created EEMS – an energy software tool that measures the energy and environmental performance of municipal operations and tracks information on all facilities, street and traffic lights, water and wastewater treatment, power generation, and transportation.
- York Region has made EEMS available to other municipalities and is marketing the software solution. The Region has already licensed the system to Waterloo Region and the Town of Markham in 2004, Halton Region in 2005 and most recently the Town of Oakville in 2006. EEMS has also been presented to a host of municipalities and many have expressed interest in obtaining a license.
- Regional staff formed a monthly EEMS Knowledge Exchange Call which brings together a committee of EEMS licensees who meet on a regular basis to discuss and share industry best practices, as well as strategies around commissioning, maintaining and upgrading EEMS. Staff have already updated the EEMS license agreement and included an enhancement model that allows licensees to cost-share future potential system upgrades.
- The EEMS system enables bill verification and advanced billing practices. In partnership with the Finance Department, staff have eliminated \$30,000 per annum in utility bill late payment charges.
- In 2005, staff advanced the EEMS operational effectiveness and position in the municipal market. Regional staff spearheaded an electronic utility invoice data initiative with local distribution companies (e.g. PowerStream, Hydro One) and engineered an interface for seamless data transfer to the Region's EEMS software. Seamless electronic invoice data transfer is a first for municipalities in Ontario.
- The Region was awarded the 2005 FCM Sustainable Communities Award (Energy) for the development of the EEMS software.

Demand Response (DR):

- Given the serious grid reliability issues in York Region expressed by the Ontario Power Authority, Regional staff investigated various DR concepts in 2005. This included enabling technology such as interval meters that allow staff to monitor real-time energy usage on its larger sites (e.g. Water Pumping Stations), coupled with controls aimed at shifting peak electricity demand to address grid reliability concerns with the net effect of reducing the Region's energy bill.
- One concept involves utilization of the Region's emergency power capability to offset the Region's own electricity use during peak demand periods. The Region owns and operates emergency generation located throughout the municipality to provide backup power to its critical infrastructure. In November of 2005, the Ontario Power Authority (OPA) released a Request for Proposals (RFP) for 20 MW of DR in Northern York Region. This RFP created a market for utilization of the Region's emergency power generation and an opportunity for the Region to increase its role in addressing the grid reliability issues in York Region.
- In response to the OPA RFP, staff received proposals from various firms that, in general terms, set out "leasing" the Region's emergency power assets in return for the Region receiving environmental upgrades to its emergency power generation assets, annual contribution payments for the term of the agreement and a reduction in its electricity bill for the periods in which the emergency power is utilized. The net result is a positive cashflow to the Region and ownership of the environmental upgrades.
- After considerable evaluation and due diligence, York Region provided one firm with a "Letter of Support" to form part of their submission to the OPA 20 MW DR RFP. In this concept, the firm would act as an Aggregator and would be granted a "license" to utilize the Region's existing standby generators at specific locations. The letter confirmed that, subject to the firm being successful in the OPA RFP evaluation process and subject to York Region Council approval, a specified capacity of standby generation may be available upon an arrangement satisfactory to the parties and the proper adherence to regulatory requirements regarding the generation of electricity using municipal assets. This would include the establishment of a separate municipal corporation and the transfer of required assets to this entity.
- While we continue to pursue this option, a legal issue must be resolved. Section 142 under the *Electricity Act, 1998*, restricts municipalities from generating electricity unless it occurs through an Ontario *Business Corporations Act* (OBCA) corporation. Furthermore, under the *Municipal Act, 2001*, in order to do this a municipality must also establish a separate holding company to hold the shares of this corporation. Regional staff are exploring this issue with the Province, and issued a letter in April

to the Ministry of Energy in support of an exemption from the applicable regulation. If the Region is successful in the RFP process and the legal hurdle has been removed a separate report will be tabled for Council later in 2006.

Natural Gas Strategic Procurement:

- Through strategic natural gas management the Region continues to achieve price risk management and significant cost savings. In 2005, the Region saved \$177,000 through its gas contracts with a bulk purchasing program created by the Association of Municipalities (GASAMO) and the Ontario Association of Non-profit Homes and Services for Seniors (OAHNASS), with small gas volumes with a number of other gas retailers.
- Regional staff are represented on the Association of Municipalities Ontario (AMO) Energy Advisory Committee and in 2005, worked closely with AMO on the development of a natural gas RFP for future natural gas purchases.

Electricity Procurement:

- In 2005, as part of the AMO Energy Advisory Committee, staff evaluated the results of an RFP for the provision of electricity procurement services and provided strategic input into the formulation of a province-wide electricity bulk-purchasing program. Regional staff also developed representative electricity load profiles for all Regional electricity accounts to strategically position the Region for a successful future purchase of electricity.
- Staff also conducted an electrical load profiling study and power quality assessment on a representative sample of Regional facilities to determine the most cost-effective electricity rate option and identify any power factor anomalies leading to cost-savings. Furthermore, staff identified promising accounts for interval meter locations and co-ordinated their installation.
- Through participation in the AMO Electricity Procurement program the Region would avoid legal fees associated with the development of master electricity purchase agreements and benefit from volume discounts. A report on the Region's electricity procurement strategy will be tabled for Council's consideration in 2006.

Street Lights and Traffic Signals Electricity Charges:

- Over the past few years Regional staff have lobbied the Ontario Energy Board (OEB) on the need to revamp how our distributors charge for street lighting and traffic signals given the variability and inconsistency in its treatment.

- In response, the OEB put forth an interim solution for 2006 that reduces monthly customer charges per location by 50%. As a result of this interim solution the Region is estimated to save approximately \$53,000 in 2006. Furthermore, Regional staff have requested that the OEB expand this solution to all street lighting and traffic accounts.
- In 2006, Regional staff will continue to consult with the Province to identify other inconsistencies that can further reduce the changes for street lighting and signals.

4.2 Sustainable Buildings

A main pillar of the Energy Management Program is “Sustainable Buildings”. The approach is multi-pronged and part of a broader Regional Sustainability Initiative that encompasses Smart Growth, VIVA rapid transit and the Greening Strategy.

New Buildings:

- On April 27, 2006, Regional Council approved the development of the Region’s first Sustainable Design and Construction Standard that specifies a minimum LEED® Silver for new Regional facilities over 500 m² (5382 ft²) gross floor area and the implementation of sustainable design principles for retrofit and renovation projects on an individual business case assessment basis.
- The Region has already embarked on its first LEED® project, a joint LEED® Silver Fire and Emergency Medical Services (EMS) station in partnership with its lower-tier municipality in the City of Vaughan. The 13,000 ft² facility combines both Fire and EMS equally under a 50/50 space usage and cost-shared agreement. This new Fire/EMS building is designed to achieve energy cost savings of 42% with respect to the Model National Energy Code for Buildings (MNECB). As a result of its high performance, the building is eligible for a number of grants including the Commercial Building Incentive Program, Enbridge New Building Incentives and funding under the Federation of Canadian Municipalities Energy RFP. These grants offset much of the premium cost for LEED® certification.
- In 2005, the Region also began construction on the Blue Willow (Housing) facility (60% more efficient than code) and completed the Bales Drive, Transportation and Works Operations Centre (15% more efficient than code and incorporates an advanced lighting control system, and a state-of-the-art sewage treatment and greywater recycling system).
- In 2006, staff will continue to develop an integrated design framework, maximize funding opportunities, and investigate performance procurement options leading to enhanced energy and environmental performance of the Region’s building portfolio and minimum lifecycle costs.

- AMO has expressed initial interest in partnering with York Region to deliver sustainable design services to other municipalities across its membership base.

Existing Buildings:

- An energy retrofit was completed in 2005 of the 497,000 ft² Administrative Centre in Newmarket. This comprehensive retrofit which includes lighting, mechanical and water upgrades, is estimated to save \$200,000 annually in utility expenditures. A report summarizing the energy performance improvements was tabled for Regional Council in January 2006. Grant applications were submitted to offset the capital costs of the retrofit, and funding agreements have already been entered into with Natural Resources Canada and Enbridge Gas Distribution. In 2006, staff will review the feasibility of certifying the Administrative Centre LEED® - Existing Buildings.
- The Administrative Centre energy upgrades include: new energy-efficient lamps and ballasts throughout the building, occupancy sensors and daylighting controls that automatically take into account work schedules and natural daylight, lighting redesign in certain areas to match the functionality of the space and improve overall light performance, low-flow showerheads and faucet sensors, and various high efficiency heating, ventilation and air conditioning (HVAC) measures.
- An “Energy User Guide” was created for all York Region employees to increase ownership in the energy and environmental improvements being undertaken and to provide useful tips for energy conservation at work.
- As part of the corporate-wide Building Energy Feasibility Study initiative, staff completed audits of York Region’s building and Housing York Inc. (HYI) portfolios with plans to conduct water and wastewater energy feasibility studies in 2006. The studies completed on the Regional portfolio were completed at no cost to the Region (100% leverage from two funding sources).
- Looking ahead, the Energy Management Program will increase its focus on Water and Wastewater and Housing, as they represent a significant portion of the Region’s energy needs. Major energy and water reduction measures are already planned for Regional and HYI building stock in 2006. The Energy Management Program will manage a new energy staff complement in 2006, dedicated to the HYI portfolio.

4.3 Clean Air

There is an unequivocal link between energy use and environmental impact. The Energy Management Program quantifies these impacts through the Energy and Environmental Management System and identifies clean and cost-effective ways to reduce the Region’s ecological footprint.

Wind Energy:

- The Region embarked upon a wind energy pilot project in 2004, to look at ways it can utilize wind energy to offset the electricity use at Regional facilities and reduce the Region's dependence on the electricity grid. The wind energy project includes the completion of a Wind Energy Pre-feasibility Study in the Towns of Whitchurch-Stouffville and Georgina and a wind energy map analysis based on the Provincial Wind Map for Ontario.
- The studies were completed in 2005, and identified a site for a pilot wind project. Staff are now moving forward with the construction of a meteorological tower to obtain site-specific wind speed and direction data for one year to establish the business case for a wind energy project on the site.
- A report on the wind monitoring station and the Region's role in wind energy were approved by Council in January 2006.
- The benefits of a wind project would translate into improved air quality, a reduction in greenhouse gas emissions, improved system reliability, stability and reduced line losses and savings for York Region taxpayers.

Corporate Environmental Initiatives:

- The Energy Management Program is a significant contributor to corporate environmental initiatives, including membership on the State of the Environment Report Working Group, Corporate Clean Air Task Force (CCATF), CCATF Department Lead and Chair of the CCATF Energy and Green Procurement Working Group.
- In 2005, staff took the initiative to develop a Request for Information (RFI) New and Emerging Clean Air Solutions and worked closely with the Region's Economic Development office to raise awareness of the RFI and other Regional environmental initiatives at major conferences and in trade publications.
- The Energy Management Program performs emission calculations and submits mandatory emission reports on behalf of the Region in order to meet its requirements under National Pollutant Release Inventory and Ministry of Environment Reg. 127.
- In 2006, the Energy Management Program will manage a new environmental contract position to conduct technical, economic and environmental due diligence activities on the proposed CCATF clean air action plans and promising measures identified through the RFI.

4.4 Relationship to Vision 2026

Vision 2026 identifies quality communities and enhanced environment as two of its principle goals. As a key player in community development, the Region has the opportunity to show environmental stewardship and leadership through its Energy Management Program by ensuring that its own facilities and operations are built and managed in a responsible and sustainable manner.

5. FINANCIAL IMPLICATIONS

5.1 2005 Savings

The Energy Management Program has thus far focused on self-financing the initial groundwork stages of its program through operational efficiencies, grants and EEMS license sales. As the Region proceeds to design more energy-efficient buildings and implement the findings of the energy studies significant cumulative savings will result – acting effectively as a hedge against rising energy costs.

In December 2004 a previous report was tabled for Regional Council summarizing the performance of the Energy Management Program and projected savings. This report indicated that the program had generated \$251,000 in net savings in 2004 and projected savings of an estimated \$487,000 in 2005 relating to the program and grants. The total program and grant savings for 2005 is \$502,204, which exceeds the 2004 projected savings by \$15,204.00.

Table 1 summarizes the financial performance of the program for 2005. These program-related savings exclude grants and annual utility savings (Tables 2 and 3). Full staff complement levels for the Energy Management Program were not attained until the fourth quarter of 2005.

Table 1
Energy Management Program Savings (2005)

	Savings (\$)
Natural Gas Procurement	177,000
Late Payment Avoidance	30,000
EEMS Licenses	20,000
Total	\$227,000

The Region was successful in securing grants in 2004 and 2005 for energy-efficiency studies, design and retrofits. This grant funding is dispersed in instalments through 2004 to 2006.

Table 2
Energy Efficiency Grants (2004-2006)

	Grants (\$)
Natural Resources Canada	244,088
Federation of Canadian Municipalities Green Funds	52,500
Enbridge Gas Distribution	40,616
Environmental Careers Organization (wage subsidy)	22,000
Total	\$359,204

5.2 Outward Year Savings

Regional staff expects savings will grow in 2006 and beyond due in large part to investment in energy design and retrofits. The retrofit of the Administrative Centre was completed at a gross cost of \$1.5 Million and is eligible for financial incentives totalling over \$120,000, resulting in a net cost of \$1.4 Million and a payback of approximately seven years. Beginning in 2006, the retrofit is expected to achieve \$200,000 in annual energy savings. Beyond 2006, future planned energy retrofits in the Regional and Housing York Inc. building portfolio are eventually expected to save \$165,000 and \$210,000 in annual utility savings, respectively.

The Region will realize annual energy savings of approximately \$25,000 and \$50,000 for the energy-efficient design of the Transportation and Works Operations Centre and Blue Willow Housing development, respectively. The Fire/EMS station, a project which targets LEED® Silver in the City of Vaughan, is expected to achieve \$12,629 in annual utility savings and is eligible to receive grants totalling over \$25,000 in 2006.

In addition, there will be additional utility savings in the street light and traffic signal area in 2006 of an estimated \$53,000 as well as potential significant savings associated with demand response (e.g., utilization of emergency power) and electricity procurement. The Energy Management Program has already submitted grant applications to various funding entities early in 2006 in efforts to further reduce costs.

Table 3 provides estimated annual program and utility forecasted savings to be realized in 2006 and/or 2007.

Table 3
Annual Energy Management Program and Utility Savings (2006-2007)

	Savings (\$)
Administrative Centre Energy Retrofit	200,000
Street & Traffic Light Customer Service Charge Reduction	53,000
Blue Willow Housing Energy-efficient design	50,000
Bales Drive Transportation & Works Operations Centre	25,000
Late Payment Avoidance	30,000
EEMS Licenses	20,000
LEED® Silver Fire/EMS	12,629
Natural Gas Procurement	TBD
Electricity Procurement	TBD
Demand Response (e.g. utilization of emergency power)	TBD
Total	\$390,629

6. LOCAL MUNICIPAL IMPACT

The Region's Energy Management Program benefits residents and local municipalities by contributing to lower demand for utilities and large-scale infrastructure, enhanced Regional air quality and a reduction in greenhouse gas emissions.

7. CONCLUSION

York Region began its Energy Management Program less than three years ago and has already achieved approximately \$500,000 in program savings to-date, accessed over \$350,000 in grants and completed an energy retrofit leading to \$200,000 in annual savings. In 2005, it received the FCM-CH2M Hill Sustainable Community Award for the development of the Energy and Environmental Management System. In addition, staff are frequently asked to present the Region's Energy Management Program at major conferences and events to highlight its success and catalyze similar efforts across the municipal sector.

The Energy Management Program fulfils the Region's need for reliable and cost-effective energy supply and management while positioning the Region as a leader in energy efficiency and environmental performance. The most significant stream of cost-savings – energy-efficient building design and retrofits – is yet to be fully realized.

The Senior Management Group has reviewed this report.