INFORMATION REPORT

TO: Chairs and Members Public Works Committee	**WARD(S) AFFECTED:** CITY WIDE
COMMITTEE DATE: May 16, 2013	
SUBJECT/REPORT NO: 2012 Annual Energy Report (City Wide) - (PW13033)	
SUBMITTED BY: Gerry Davis, CMA General Manager Public Works Department **SIGNATURE:**	**PREPARED BY:** Tom Chessman Manager, Office of Energy Initiatives (905) 546-2424, Extension 2494

Council Direction:

As part of the City's Corporate Energy Policy (Report PW07127) staff are directed to provide an annual energy report highlighting the progress and results of various City energy initiatives.

Information:

The City of Hamilton's Corporate Energy Report, attached as Appendix "A" to Report PW13033, provides a summary of energy usage and cost savings initiatives for the calendar year 2012. The report also highlights the cumulative savings achieved from May 2006 to year-end 2012. Savings of $4.5 million was achieved for the calendar year 2012. This takes the City's total cumulative savings to approximately $27.6 million dollars since 2006, saving an average of $21.50 per household per year over the life of the program.

The most significant key performance indicator in the City's Corporate Energy Policy is the 20% reduction target in energy intensity by 2020. Energy intensity is measured against the base year of 2005. As of year-end 2012, the City's building portfolio has achieved a 17% reduction in energy intensity versus the 2005 the base year.

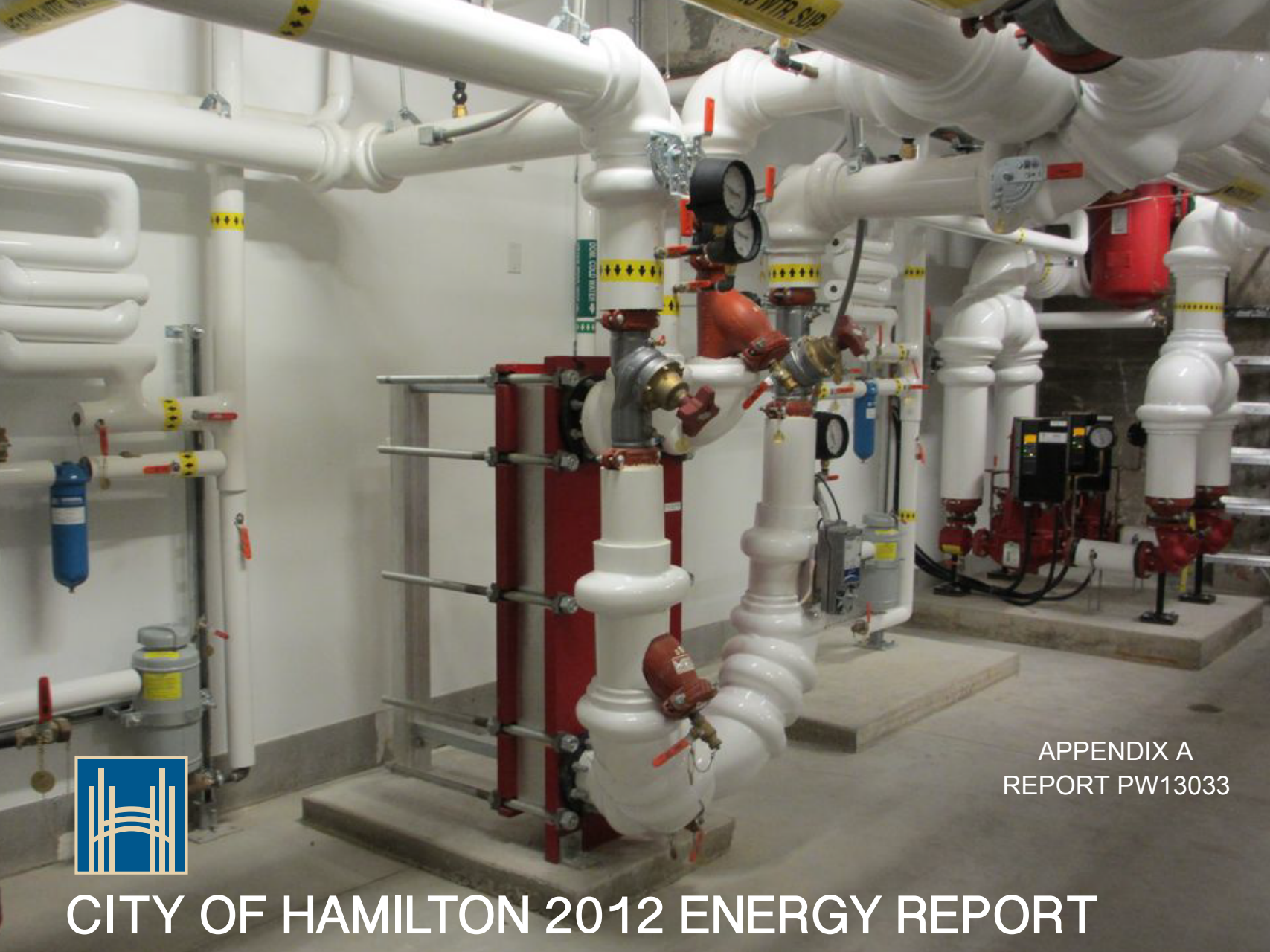
Energy savings are tracked for both Levy (tax base) Rate (water rates) savings. Furthermore, savings are tracked as direct cost savings and avoided costs. An example of avoid costs would be the dollar amount the City would have incurred had steps not been taking to reduce energy usage or by negotiating better energy supply pricing.

The savings are indicated in the table below.

Savings / Avoided Costs	Levy Benefits (Tax Base)	Rate Benefits (Water Rates)	Corporate Total (s)
Avoided Costs:	$14,273,000	$5,803,000	$20,076,000
Direct Savings:	$6,852,000	$662,000	$7,514,000
Total Cost Reduction & Savings:	$21,126,000	$6,464,000	$27,590,000

The City of Hamilton's commitment to energy conservation and environmental sustainability plays an important role in supporting the City's Strategic Plan by contributing to a prosperous and healthy community, providing valued and sustainable services and demonstrating innovation and leadership.

The City's annual energy report will be posted on the City's website once the report has been received by Council at www.hamilton.ca/energy.



APPENDIX A
REPORT PW13033

CITY OF HAMILTON 2012 ENERGY REPORT

INTRODUCTON

The City of Hamilton takes a leading role in the conservation of energy and corporate environmental sustainability throughout City owned facilities and City operated processes. This dedication to conservation and demand management plays a vital role in meeting its citizens' needs and protecting human health through lowering greenhouse gas emissions. These efforts conserve natural resources and support the local economy through job creation. The promotion of energy awareness and conservation also allows the City of Hamilton to mitigate its exposure to volatile energy pricing through sound energy procurement strategies and energy efficiency measures.

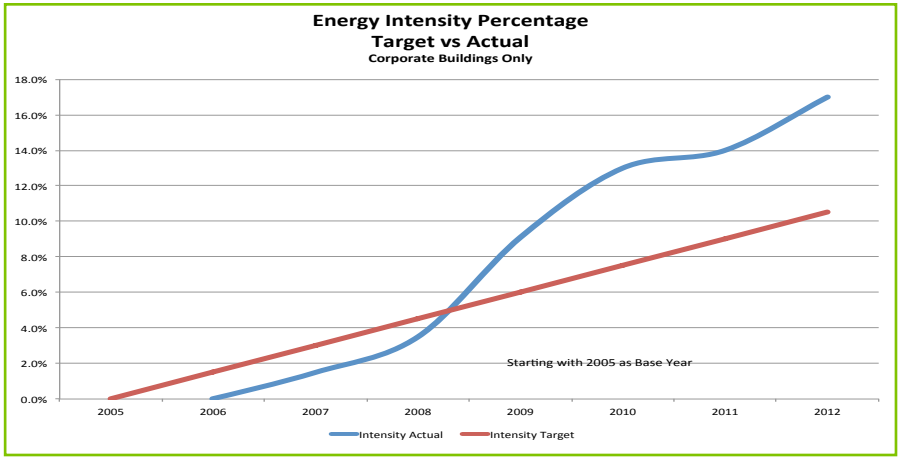
The Corporate Energy Policy provides guidance to all City Departments to ensure the City achieves its targeted goal. The document provides high level recommendations and plans to build energy conservation into the planning process for projects, standards of performance for operations and guidance on monitoring and reporting energy use. Fundamental to the Corporate Energy Policy is the Life Cycle cost analysis for new construction or renewal projects. All projects and their costs are analyzed over the life of the proposed equipment in order to highlight measures that are not only energy efficient, but cost effective over the life of the equipment and facility. The result of this activity has led to an accumulated savings of $27.6 million, a 17% reduction in energy intensity, lower operating costs and a boost to local jobs.

The Energy Policy calls for targeted energy reductions in energy intensity of City owned facilities and operations of:

- **3% by 2009**
- **7.5% by 2012**
- **20% by 2020**

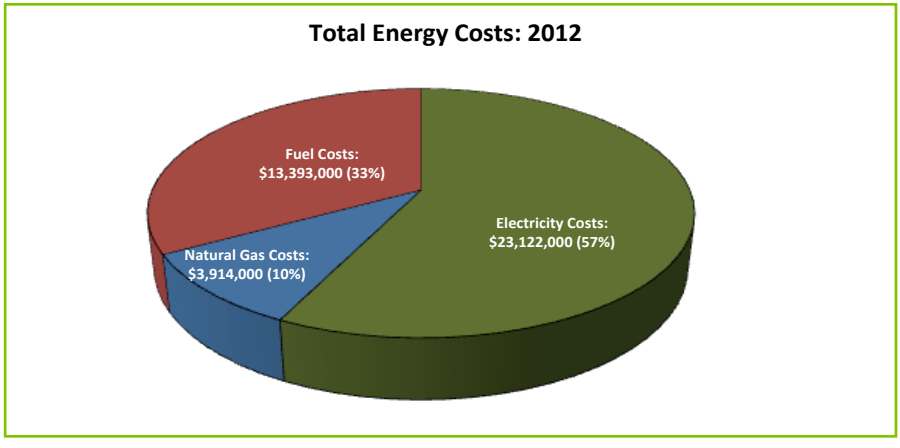
The reduction targets are measured against the base year of 2005 and equate to a 1.5% reduction in energy per year.

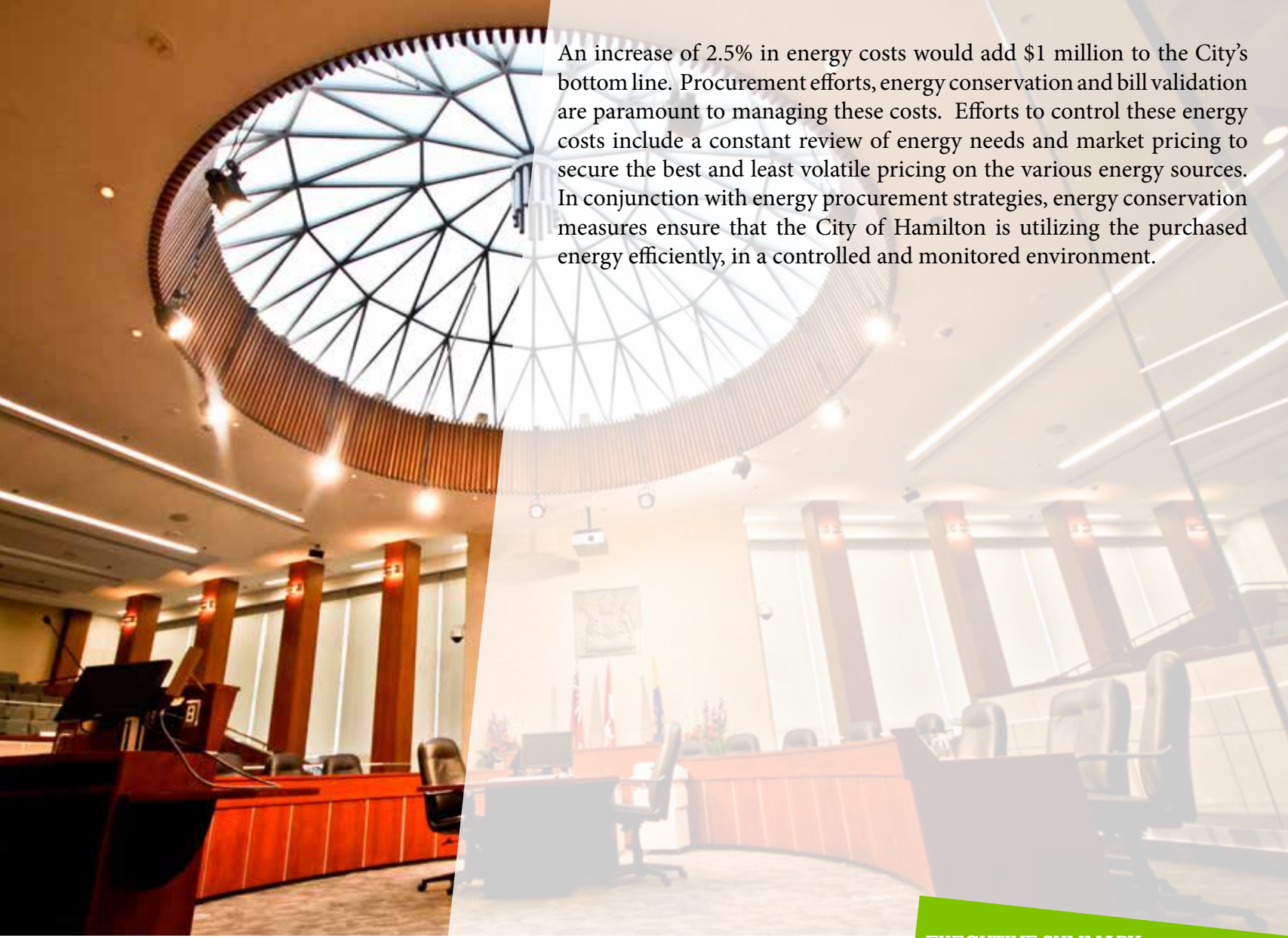
In 2012, the City of Hamilton implemented a number of new construction projects that were developed with energy efficiency and resource conservation as a fundamental project goal. Guided by the Corporate Energy Policy (Reference: PW07127), these projects demonstrate the City of Hamilton's desire to not only reduce consumption in existing facilities, but to create modern, efficient, healthy facilities for the citizens of Hamilton.



EXECUTIVE SUMMARY

Energy costs for the City of Hamilton totaled $40,429,000 for 2012. These all in costs consist of the prices paid for electricity, natural gas and fuels such as diesel and unleaded gasoline as well as their transmission, transportation and delivery costs. Included in these figures are the energy costs for the City's district energy system which provides efficient and reliable heating and cooling for it's downtown core buildings. The chart below shows that electricity costs account for approximately 57% of the City's energy costs, with fuel accounting for 33% and natural gas the remaining 10%. In addition, the City of Hamilton spent $2,321,000 for water consumption in 2012 and while this is not an energy source, it is another utility that is managed in an effort to improve efficiency and reduce costs.





An increase of 2.5% in energy costs would add $1 million to the City's bottom line. Procurement efforts, energy conservation and bill validation are paramount to managing these costs. Efforts to control these energy costs include a constant review of energy needs and market pricing to secure the best and least volatile pricing on the various energy sources. In conjunction with energy procurement strategies, energy conservation measures ensure that the City of Hamilton is utilizing the purchased energy efficiently, in a controlled and monitored environment.

17% Energy Intensity Reduction

The City of Hamilton has reduced its energy intensity across City owned and operated facilities by 17% compared to the 2005 base year identified in the Corporate Energy Policy. It should be noted that facilities from Public Works, Community Services, Fire/EMS, Libraries, HECFI, and Police all contribute to the energy intensity target. Process oriented uses of energy, such as Hamilton Water operations, are not included in the measured energy intensity target. The efforts to date have yielded positive results in both the reduction of the City of Hamilton's energy intensity and controlling energy costs. The City's Corporate Buildings is ahead of schedule in meeting the targeted energy intensity reduction goal as defined in the Corporate Energy Policy. The remaining portion of our energy intensity target will present greater challenges in future years. Maintaining the same focus in 2013 combined with council support will pave the path to a successful achievement of our goal of 20% reduction by 2020. A number of initiatives were implemented in 2012, such as:

- **North Wentworth Twin Pad Arena (new construction)**
- **Morgan Firestone Arena (expansion)**
- **Hamilton Water pump station at Stonechurch and Garth (pump upgrades)**
- **Hamilton Water Ferguson Ave pumping station (new construction)**
- **Lister Block, District Energy (connection and transfer of ownership)**

The cumulative total savings of all projects, from 2006 to the end of 2012 is $27.6 million. These savings represent the combined efforts from three areas: utility rate optimization and cost avoidance, cash back and energy conservation projects. The total staffing cost to secure these cumulative savings was $3.1 million since the Office of Energy Initiatives (OEI) was formed in 2006 to the end of year 2012.

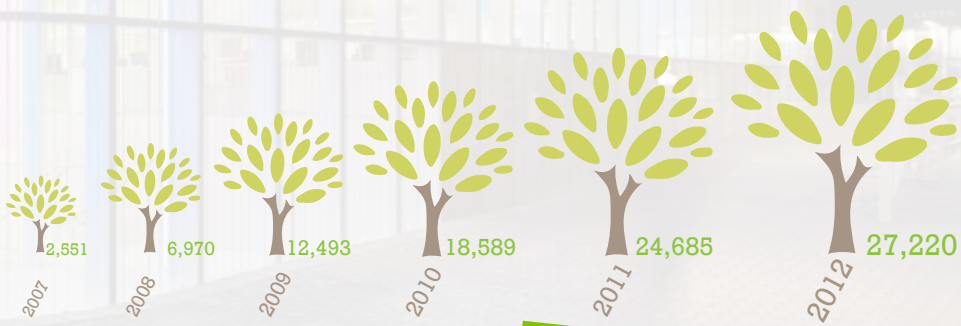
Greenhouse Gas Emissions

Hamilton's Vision 2020 is a vision towards "a strong, healthy, sustainable Hamilton shared by citizens ". Within the statement are fourteen key themes that work towards this goal and among them is:

- **Consuming less energy**
- **Improving air quality**

Lowering energy use by implementing Energy Conservation and Demand Management projects saves money, and reduces the City's emissions. Starting in November 2006, the cumulative total in tonnes of equivalent carbon dioxide (CO2e) from all the projects that have been implemented to the end of 2012 is 27,220 metric tonnes. This does not account for additional reductions in GHG emissions as a result of initiatives undertaken by Hamilton Renewable Power Inc. (HRPI), Fleet and Transit departments. For a complete report on Climate Change and GHG emissions reductions and initiatives please visit: www.hamilton.ca/climatechange.

Greenhouse Gas Emission Reductions (Tonnes)



The majority of these emission reductions are directly related to electrical energy reductions. In Ontario the emission factor (amount of CO2e per kilowatt-hour) is determined by the mix of generation types within the province and from time to time, the type of energy imported into Ontario. Fortunately these emissions have been going down as less and less electricity is produced by coal and more electricity is being produced by renewable energy sources. As this shift progresses, it will mean more kilowatt-hours need to be conserved in order to keep pace with our greenhouse gas reduction goals.

Energy Savings and Avoided Costs

The City of Hamilton's efforts to reduce energy consumption and control costs are provided through three key focus areas:

- Utility Rates and Cost Avoidance: Mitigate financial risks associated with energy market volatility and regulatory changes by executing a procurement strategy that incorporates rate and tariff analysis, supply contract management and the assessment of market conditions.

- Cash Back: Costs recovered through the analysis of energy bills and correction of billing errors.

- Energy Conservation & Incentives: Energy and associated cost savings through the implementation of energy efficiency projects, combined with incentive programs offered through electricity and natural gas providers.

Utility Rates and Cost Avoidance

The main driver in this category was the Global Adjustment calculation for the Woodward site electricity bill, combined with four additional sites which were reclassified into "Class A". These sites are the Central Utilities Plant, Copps Coliseum, Materials Recycling Facility (MRF) and the Greenhill Waste Water Plant. By changing the electricity rate structure to "Class A", the City avoided $1.5 million in electricity costs that would have otherwise been included on the Global Adjustment line item of the electricity bill. Other cumulative avoided cost savings include natural gas hedging and past electricity savings, which combined with the current year Global Adjustment savings brings this sub category to $13.1 million.

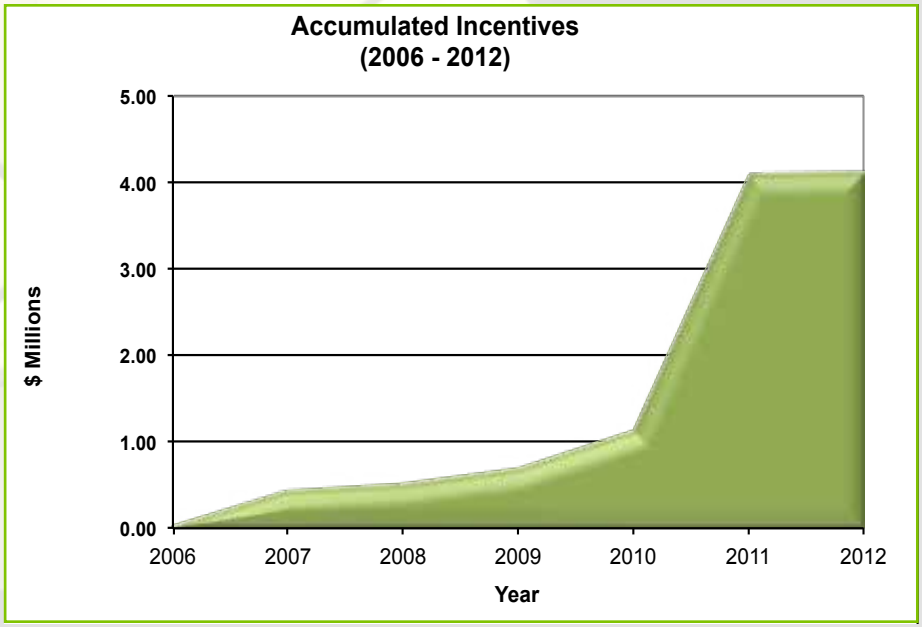
Cash Back

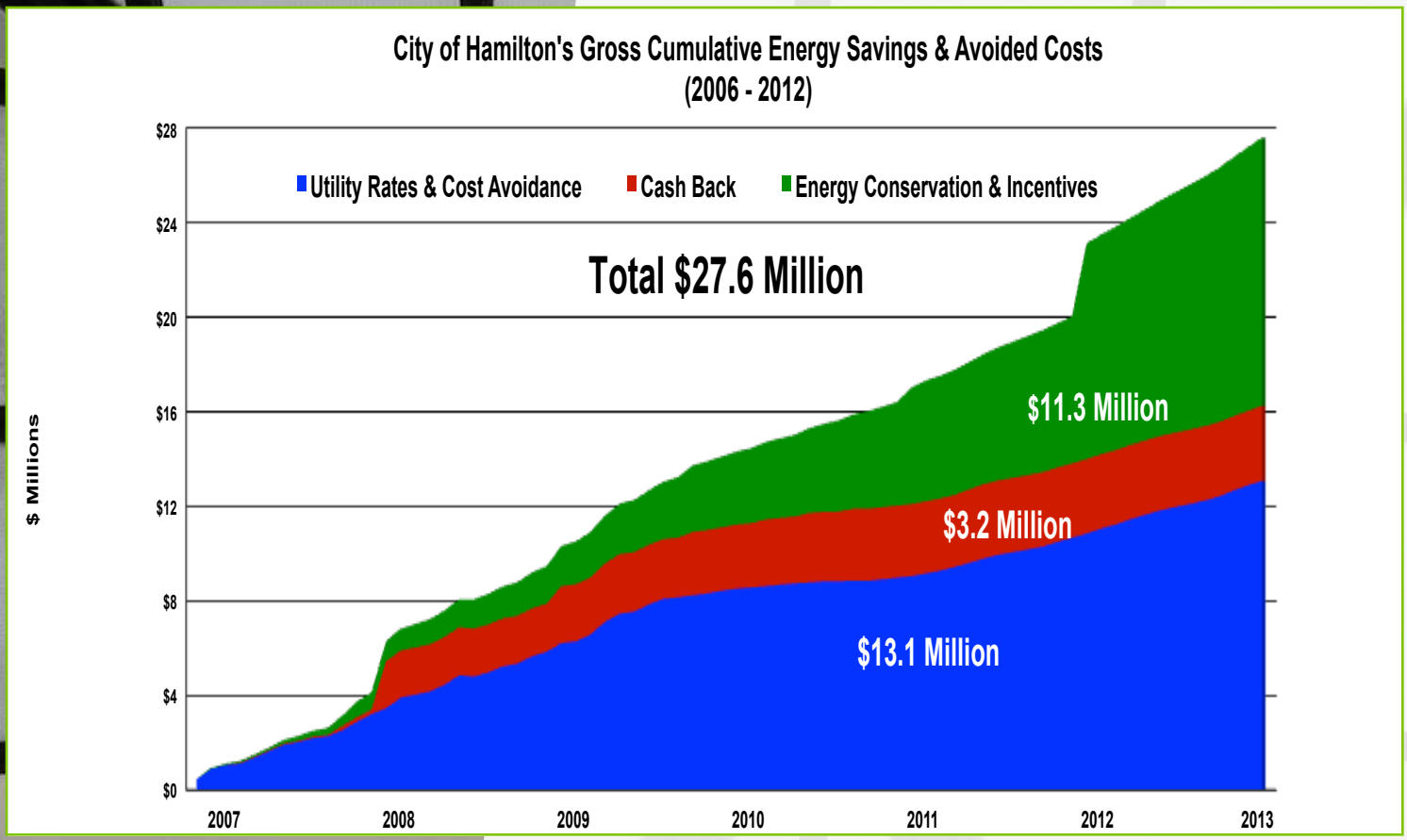
Avoided costs in this category are from the recovered costs of billing and metering errors and adjustments that result in a cumulative total cash back of $3.2 million since 2006. The process of tracking bills and performing adjustments through continuous monitoring helps ensure that energy supply companies provide correct and accurate bills to the City of Hamilton. The City of Hamilton leverages existing software and in-house expertise to review billing and spot these anomalies in the billing process.

Energy Conservation and Incentives

The energy conservation category tracks energy reduction and incentives from energy related projects which now totals $11.3 million. In 2012, the High Lift pump station project and recent lighting retrofits contributed a significant portion of the $2.2 million in overall energy savings for 2012, with the High Lift Pump Station alone saving $400,000 annually.

The City of Hamilton continues to leverage available incentive programs for energy efficiency projects. These incentives help offset project costs by collecting the incentive money once energy efficiency projects have been installed and verified. To date, staff efforts have recovered nearly $4.1 million of project costs through various incentive programs.




City of Hamilton's Gross Cumulative Energy Savings & Avoided Costs
(2006 - 2012)
$ Millions
$28
$24
$20
$16
$12
$8
$4
$0
Utility Rates & Cost Avoidance
Cash Back
Energy Conservation & Incentives
Total $27.6 Million
$11.3 Million
$3.2 Million
$13.1 Million
2007
2008
2009
2010
2011
2012
2013

CORPORATE ENERGY USE AND COST

Energy Consumption

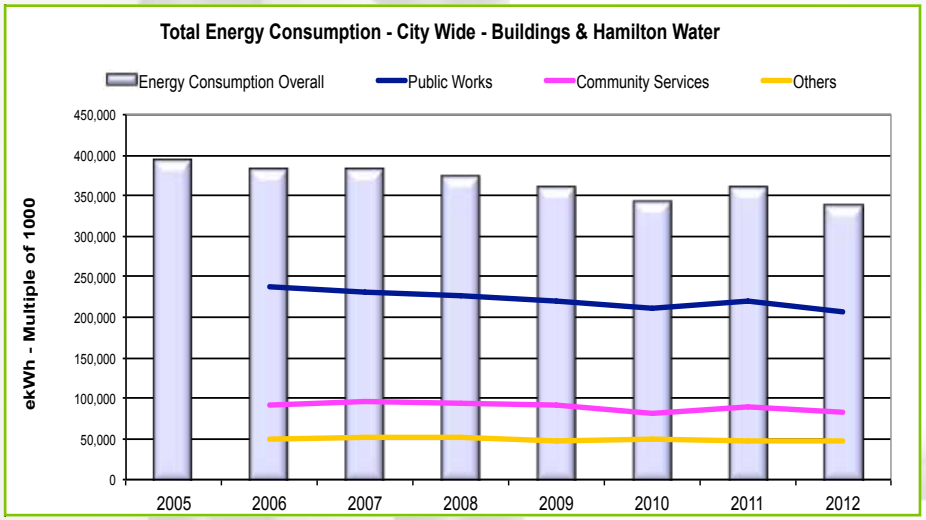
Tracking of the City's corporate energy use and cost centers include Public Works, Community Services and other city departments such as Fire, Emergency Services, Police and Libraries. The table below shows the total consumption numbers for electricity and natural gas for the 2012 year compared to the base year (2005). Total numbers report on consumption of process oriented energy use such as water and wastewater operations. As with previous reports, the areas excluded are housing, traffic and street lighting.

Utility Consumption	2005	2012	2012 vs 2005
Electricity (kWhs)	239,307,800	216,260,400	-10%
Natural Gas (m3)	14,279,100	11,650,400	-18%
Total Energy (ekWhs)	**391,665,500**	**338,239,400**	**-14%**

For 2012 the City experienced:

- **Reduced Electricity consumption by 10% vs. baseline 2005**
- **Reduced Natural Gas consumption by 18% vs. baseline 2005**
- **Reduced combined energy consumption (ekWh) by 14% vs. baseline 2005**

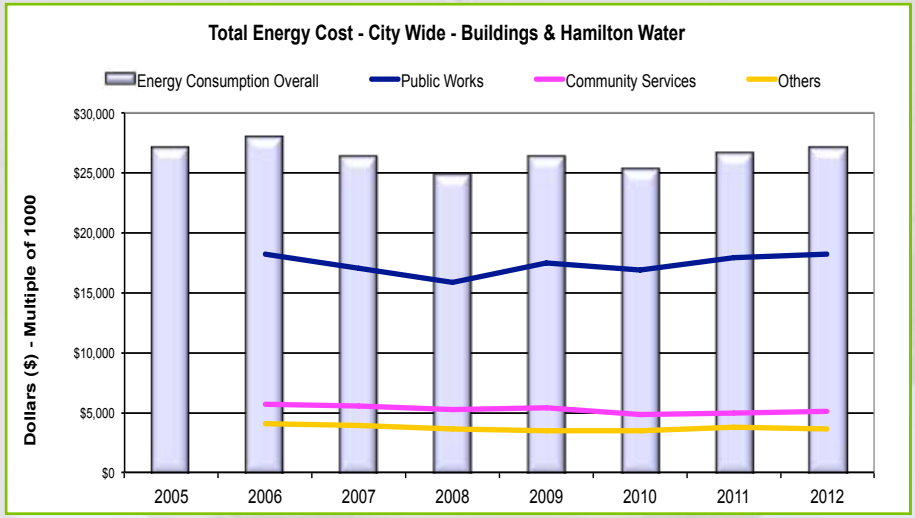
kWh = kilowatt hours / m3 = cubic meters / ekWh = equivalent kilowatt hours


Total Energy Consumption - City Wide - Buildings & Hamilton Water
Energy Consumption Overall
Public Works
Community Services
Others
ekWh - Multiple of 1000
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
2005
2006
2007
2008
2009
2010
2011
2012

Energy Costs

As conditions and drivers change in Ontario's energy markets, so too does the City's cost factors. In this year's results, the cost for electricity is 10% higher than the 2005 baseline year. In contrast, the cost for natural gas decreased by 36% relative to 2005 and thus results in a combined net increase of 0.03%.

Utility Cost	2005	2012	2012 vs 2005
Electricity Cost	$20,939,600	$23,122,300	10%
Natural Gas Cost	$6,088,300	$3,914,000	-36%
Total Energy Cost	**$27,027,900**	**$27,036,300**	**0.03%**



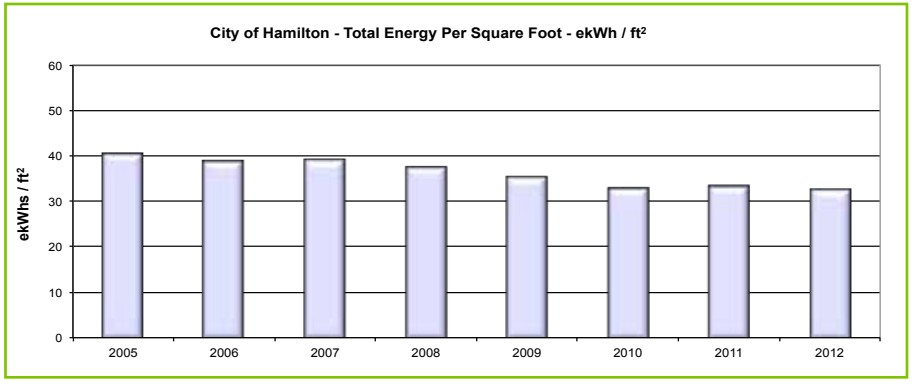
KEY PERFORMANCE INDICATORS & SAVINGS

Key Performance Indicators

Measurement of the overall energy intensity per square foot of a building is calculated every year relative to the 2005 base year and is reported against the target set out in the Corporate Energy Policy. This calculation is net of energy use from water and wastewater, operation and maintenance, street lighting and traffic operations. As with previous reports, this data is not weather corrected.

For 2012 the City experienced:

- Reduced Electrical consumption per square foot (kWh/ft2) by 11%
- Reduced Natural Gas consumption per square foot (m3/ft2) by 29%
- Reduced combined energy intensity per square foot (ekWh/ft2) by 17%

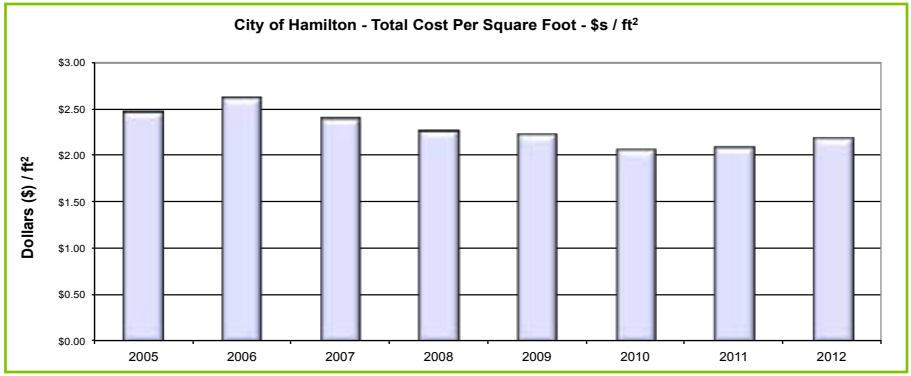


ekWh = equivalent kilowatt hours

Energy Savings

Cost intensity is also tracked using a cost per square foot measurement, relative to 2005 base year. This not only takes into account the reductions in energy intensity, but factors in changes in commodity prices from 2005 to 2012. A key driver of the lower overall costs and cost intensity is the reduced cost of natural gas..

- **Increased Electricity cost per square foot ($/ft2) by 4%**
- **Reduced Natural Gas cost per square foot ($/ft2) by 41%**
- **Reduced Combined energy unit cost per square foot ($/ft2) of 14%**



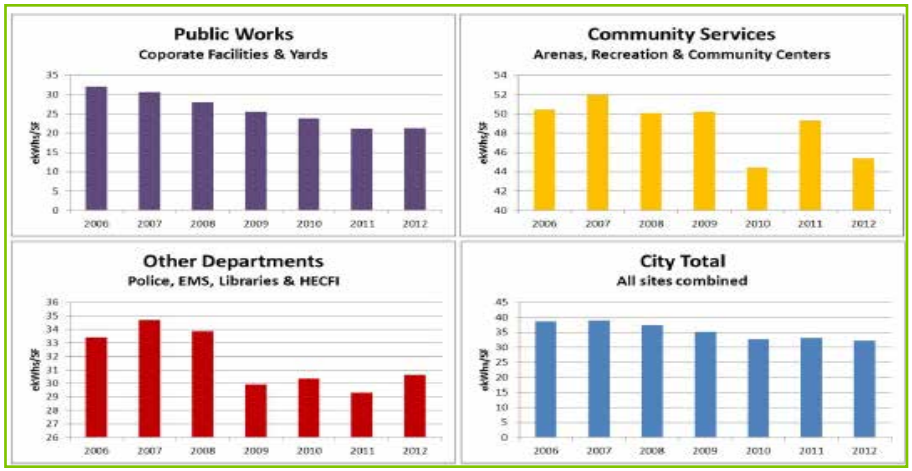
ekWh per Square Foot

Since 2006, the City has reduced its energy intensity by 17% across all Corporate Buildings. This reduction reflects lower energy use through actions taken at each site such as energy conservation measures implemented by each department at all corporate sites. This key indicator is most important as it ignores price and only relates to energy consumption per square foot.

The Public Works Department, which includes City/Town Halls, Corporate Facilities and Yards have reduced energy intensity by 32%. City Hall has been noted as a leader as an energy efficient building in this category.

The Community Services Department, which encompasses arenas, community and senior centers, recreation centers and golf courses, lodges and cultural buildings have reduced their energy intensity by 10%.

The Other Departments measured are Fire and EMS, Libraries, HECFI and the police, which have reduced their energy intensity by 11%. Noteworthy is the Police Department which has made substantial gains in their area by reducing their energy intensity by 21%.



In 2012, there was a realignment in various city departments. For simplicity and consistency, this report is based on the departmental structure as it was at the beginning of 2012. These changes will be accounted for and included in next years' 2013 report.

SAVINGS AND AVOIDED COSTS

The City of Hamilton essentially recovers its operating costs through the allocation of Rates and Levy. In this report, avoided costs and direct savings have been calculated to reflect the impact the Public Works Energy Program has made to each of these categories. Levy benefits manifests in the City's tax base whereas impacts made to the Rate category are a function of the water rate savings.

Avoided costs represents a dollar amount that the City would have incurred had none of the measures been taken to reduce energy use or to negotiate better energy supply pricing. One such measure is a quality assurance review of the City's fuel invoices, which netted a cost avoidance of $38,600 in transportation, delivery and price adjustment costs. Direct savings represents actual dollars that the City received through incentive programs and recovering of funds from suppliers' billing errors. Each amount is further allocated into the appropriate Levy or Rate category with the combination of both being the total cost reduction and savings.

Savings / Avoided Costs	Levy Benefits (Tax Base)	Rate Benefits (Water Rates)	Corporate Total ($)
Avoided Costs:	$14,273,900	$5,802,700	$20,076,600
Direct Savings:	$6,852,100	$661,600	$7,513,700
Total Savings:	$21,126,000	$6,464,300	$27,590,300

Embedded in these avoided costs is a $300,000 levy benefit that the Municipal Recycling Facility, Copps Coliseum and the Central Utility Plant operations received. This is a result of managing Global Adjustment charges. The Rate based facilities (i.e. Hamilton Water) that were included in the management of Global Adjustment charges benefited by $1.2 million.

The Levy portion of total cumulative cost reductions and savings for 2012 is $21,126,000 which is $2,747,000 above 2011 figures.

In the Rate portion, a cumulative benefit of $6,464,300 has been posted at 2012 year end which is $1,724,200 more than 2011 figures. Combining the two benefit streams yields an accumulated total of avoided costs and direct savings of $27,590,300 for the City Of Hamilton.

ENERGY PROCUREMENT

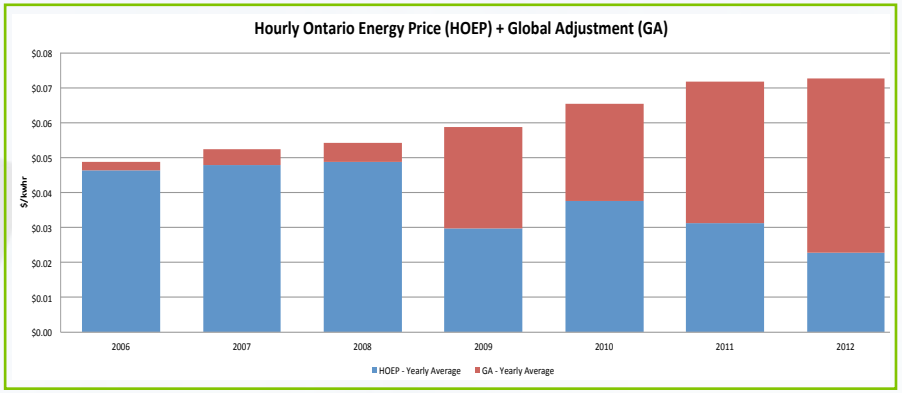
The cost of electricity in Ontario is made up of two major components categorized as the deregulated portion and the regulated portion. The deregulated portion is the price for electrical energy or commodity known as the Hourly Ontario Energy Price (HOEP). The regulated component is for fixed charges, and for the most part is comprised of the Global Adjustment charge.

While changes in the Ontario energy markets have resulted in lower HOEP costs, the combined total electricity cost ($/kWh) continues to rise as Global Adjustment charges continue to rise. In 2006, HOEP costs represented 95% of the total electricity costs while Global Adjustment charges represented only 5%. In 2012, the proportions have changed significantly, with Global Adjustment charges now accounting for 70% of the cost of electricity and HOEP charges accounting for the remaining 30%.

Ontario has a diverse mix of generation types that include hydro, nuclear, gas-fired and renewable such as wind and solar. The electricity produced by these generators varies from hour to hour as does the price, which is a function of the demand for power, the type of generation available and the price of natural gas. The Hourly Ontario Energy Price annual average for 2012 closed at 2.62 ¢/kilowatt-hour, which is down more than 34% from the 2011 average unit price of 3.52 ¢/kilowatt-hour. This decrease is largely attributed to the price for natural gas fueled generators, which sets the marginal price for the energy portion or commodity. With natural gas prices being at their lowest since 1999 for some markets, the impact on Ontario prices coupled with moderate demand for electricity resulted in a reduced average HOEP.

Global Adjustment charges are a billing line item that is in place to cover the difference between the market price and rates paid to regulated and contracted generators and also to pay for conservation and demand management programs. The reduction in HOEP pricing has resulted in a larger share of the total cost of electricity associated to the Global Adjustment.

Changes made to the method of calculating Global Adjustment provided the City Of Hamilton the opportunity to avoid $1.5 million in Global Adjustment charges throughout 2012.



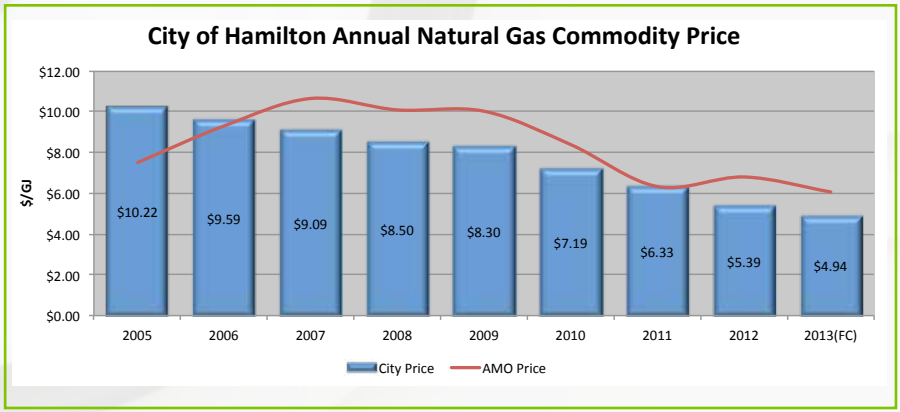
Fuel

Fuel purchasing for the City of Hamilton consists primarily of purchasing diesel and unleaded gasoline. Increases in fuel costs were offset by lower than budgeted consumption as a result of warmer than expected winter conditions. Increases in unleaded gasoline consumption and unit cost resulted in slightly higher spending than originally forecasted. The City purchased over 12.3 million litres of fuel in 2012. Inspection of fuel invoices for rate, delivery and surcharge errors resulted in $38,600 in savings. Recently, the City has received a fuel tax rebate of $24,200 for fuel used in small engines. The City of Hamilton has successfully completed more favourable supply contracts with the major suppliers of diesel and unleaded gasoline going forward into 2013.

Natural Gas

Energy Procurement continues to be a significant cost control measure for the City of Hamilton. Strategic buying of natural gas has reduced the price the City of Hamilton pays for contracted natural gas by 10% which is directly reflected in the City's 2013 budget. Current market conditions for natural gas point to a continuation of low prices throughout 2013 and well into 2014. While these market conditions mitigate price volatility, the risk of increased consumption due to harsh weather conditions must always be taken into consideration as well as the increase for utility services to new and changing building requirements.

The process of procuring the City's energy commodities is governed by the Energy Commodity Policy – PW08144/FCS08114 which also states that at least once a year the General Manager, Finance and Corporate Services and Treasure shall report to Council, any and all energy commodity price hedging agreements and other energy commodity agreements.



A number of new construction and facility renewal projects were undertaken in 2012. The following highlight some of the work done by various City Departments to deliver energy efficient solutions with the guidance of the Corporate Energy Policy.

2012 PROJECT HIGHLIGHTS

North Wentworth Twin Pad Arena

The North Wentworth Twin Pad Arena project was implemented in 2012. This 91,500 ft2 facility houses two full sized hockey rinks with elevated seating for nearly 900 people. The planning and design of the arena focused on conserving energy and building a more environmentally friendly facility for local residents. Guided by the Corporate Energy Policy, lifecycle analysis was performed on various options to review not only construction costs, but the full cost of the systems over the life of the facility. This strategy allowed the project team to provide a facility that not only makes good economic sense over the life of the building, but also focuses on energy efficiency and resource conservation. These systems have been designed to be 40% more energy efficient than the national energy model for typical arenas. Some of the energy saving and resource conservation features built into the construction of the building include:

- **Geothermal heating and cooling system**
- **Under-floor heat recovery system for bleacher zone**
- **High efficiency windows**
- **Lighting Occupancy controls**
- **Exhaust Air Heat Recovery**
- **Low flow shower faucets and sinks**

This modern, efficient and environmentally conscious facility will benefit the community for many years and use substantially less energy over its life cycle compared to a facility using more traditional construction practices.

Morgan Firestone Arena

The Morgan Firestone Arena was expanded in 2012 to allow for a second ice surface at the facility, along with spectator seating and additional change rooms. As with other projects, various systems and plans were reviewed using a lifecycle analysis to determine what kind of energy efficiency features would benefit the facility. Based on the review, several energy efficiency and resource conservation measures made it into the final construction of the facility. Some of the features include:

- Low flow plumbing fixtures: Low flow toilets, urinals, faucets and showerheads allow for 34% less water compared to standard fixtures.
- High efficiency lighting (T5): High efficiency T5 lighting was chosen over standard T8 lighting to reduce overall electrical consumption. Lighting was zoned with occupancy sensors to take advantage of shutting down lights in areas when they are not occupied.
- Heat recovery unit: Heat is extracted from all air that is exhausted from the building and transferred to the incoming fresh air in order to offset the energy used to heat the outdoor air to indoor requirements.
- Building Automation System (BAS): A building automation system was installed to monitor and control equipment, as well as adjust set point temperatures to reduce consumption when the building is not occupied.

Police Department Initiatives

The Police Department has been very successful in implementing numerous measures throughout their facilities to reduce energy usage and intensity. Many of their facilities operate in a 24/7 environment, making energy efficiency not only more important, but also more challenging. After making significant strides in recent years to reduce energy consumption through the replacement of boilers, chillers, and installation of new control systems and variable frequency drives (VFD's), the Police Department continued to lower energy consumption by converting some of the lighting in their facilities to LED lighting. In addition to implementing energy efficiency projects, the Police Department has instituted a robust preventative maintenance program that keeps equipment in their facilities operating at peak efficiency. Part of this preventative maintenance plan mandates that motors must be replaced with high efficiency equivalents. These efforts to implement energy efficiency projects combined with preventative maintenance and equipment standards have not only helped to reduce energy, but have also created a 'culture of efficiency' which ensures conservation is central to all facility-related decision making. This culture of efficiency has already resulted in just over 28% reduction in total energy intensity for the Police Department.

RENEWABLE ENERGY

The City of Hamilton demonstrates its commitment to renewable energy for the Province of Ontario through its participation with Hamilton Renewable Power Inc. (HRPI) and through the installation of photovoltaic (PV) solar rooftop systems.

HRPI is an independent, wholly owned corporation within the City of Hamilton that operates two renewable energy facilities. The City received a financial benefit of $1.7 million for 2012 operations resulting in a cumulative benefit to the City of approximately $9 million.

The system at Hamilton's Wastewater treatment plant is a 1.6 Megawatt cogeneration unit that captures methane gas produced from the wastewater treatment process to produce electricity that is sold under contract to the Ontario Power Authority. It also captures the waste heat from the generator to supplement the heat required in the water treatment process, thereby displacing natural gas that would have been used as a heating fuel for the process.

A similar type of generator at the Glanbrook Landfill facility captures landfill gases created by the normal decomposition of the landfill material to fuel two 1.6 Megawatt generators that produce electricity that is also contracted for sale to the Ontario Power Authority.

In addition to the financial benefit these two systems provide, they also contribute over 1,000,000 tonnes of CO2 emissions reductions annually to the community of Hamilton.

With the installation of a 250 KW solar energy system at 330 Wentworth and two additional solar energy systems at North Wentworth Twin Pad Arena and Morgan Firestone Arena, the City of Hamilton contributes renewable energy to Ontario's electrical system. These solar rooftop PV systems are to be installed through a leasing agreement with Horizon Utilities.

FUTURE INITIATIVES

Green Energy Act

The Ontario Green Energy Act (GEA), introduced in the Ontario legislature in February 2009, is intended to expand renewable energy production, encourage energy conservation and create green jobs. Under the Green Energy Act one specific regulation will require public agencies to:

- Report annually on energy use and greenhouse gas emissions beginning July 1, 2013 and post that information online
- Develop five-year energy conservation plans starting July 1, 2014, and post those plans online

To demonstrate the City's commitment to comply with this regulation, a section of the upcoming revised Corporate Energy Policy will address this issue.

Energy Management Information System (EMIS)

The existing Energy Management database was implemented as a means to start compiling all the data in a central location to compare and track consumption year over year. The system has been the central tool in recovering $3.14 million in billing anomalies since 2005, as well as charting the City's progress toward their goal of 20% energy intensity reduction by 2020.

The fundamental tool for managing energy consumption and tracking energy savings is a good Energy Management Information System. A properly implemented system allows staff to measure energy usage, compare with historical data, spot and correct billing anomalies, and measure and verify how much energy retrofit projects are truly having an impact.

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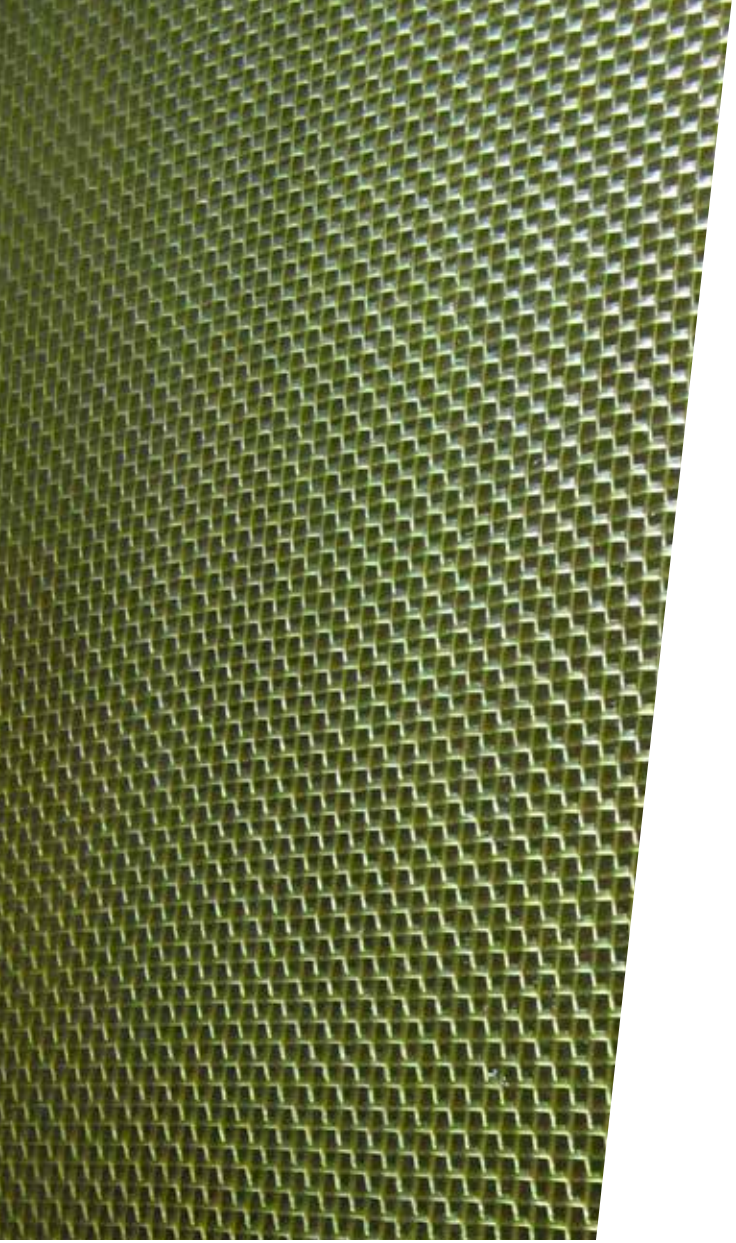
The existing version of the Energy Management Database used by the OEI is outdated and no longer supported. Due to advances in energy management processes there are now several factors to warrant consideration of implementing a new Energy Management Information System that will include considerably more tools to effectively manage the energy consumption at corporate facilities. A newly implemented system would allow for new tools such as:

- Comparison of energy intensity of various similar facilities (Benchmarking)
- Comparison of year to year data corrected for weather (Weather Normalization)
- Near real time monitoring for Demand Response Initiatives
- Advanced reporting and budgeting information

This new system would also help to address future Green Energy Act reporting requirements for municipalities that come into effect in 2013.



Energy and Operational Assessments of Hamilton Water

Hamilton Water operations consume 45% of the City's overall electricity needs. The City of Hamilton is cognizant of the potential for energy reduction in all aspects of City operations. With ongoing asset renewals at pumping stations throughout the City, the Hamilton Water department has focused on providing safe, clean reliable drinking water to its customers, while keeping energy efficiency and cost savings in mind.

In recognition of this work and future potential, the OEI will provide additional resources to assist the Hamilton Water team to assess energy use at existing pumping stations. Internal resources that have experience with water and wastewater process systems and energy will collaborate to perform energy assessments that look for operational optimization and or equipment renewal opportunities. Measures that provide acceptable payback periods will be recommended for implementation.

Energy Assessments of Corporate Facilities

Buildings change over time. Facilities are expanded, interior spaces are redesigned, and occupancy and use constantly change to meet the needs of the tasks at hand. As these changes are implemented and existing equipment ages, inefficiencies in how the facilities use energy to provide the required services to the new spaces are introduced. When aging heating, ventilation and air conditioning (HVAC) equipment is due to be replaced, it creates an opportunity to investigate and find methods to better deliver the required services to the new layout and staffing requirements of the facility.

The OEI has reviewed City owned and operated facilities and feels that several facilities will benefit from detailed energy assessments. Collaborating with internal resources, several facilities will be investigated to replace aging HVAC equipment with higher efficiency alternatives. The addition of new controls and revisions of existing distribution systems will be reviewed to provide systems designed for today's facility needs. Measures that can provide for a renewal of aging facility infrastructure combined with acceptable energy savings payback period will be recommended for future implementation.

Re-Commissioning of Existing Building Automation Systems

Re-Commissioning is an optimization process for existing buildings with existing building automation systems (BAS) that improves the building's overall performance. After an initial period of operation, existing BAS systems can be reviewed to ensure that their schedules still meet the requirements of the building and that components are efficiently controlling the devices that consume energy in these facilities. By optimizing control systems proactively, equipment performance and system integration issues can be spotted and eliminated rather than continuing to operate in an inefficient manner until larger issues draw attention to the problem.

AWARDS

Association of Energy Engineers (AEE)

The Office of Energy Initiatives received an award from the Association of Energy Engineers (AEE) for accomplishments in developing, organizing, managing and implementing an outstanding Corporate Energy Management Program.

The AEE has a membership base of over 16,000 professionals in 89 countries and is widely recognized for its energy certification programs. Awards were presented for several different categories from regions all over the world. The City of Hamilton was selected as the recipient of the Corporate Energy Management award for the Canada Region.

Ontario Power Authority (OPA)

Presented by the Ontario Power Authority to the City of Hamilton, the Community Conservation Award acknowledges exemplary conservation efforts of municipalities across Ontario for the past year. Hamilton was assessed against other communities that have a population of over 500,000 people and were measured against results in the following categories:

- Leadership
- Innovation and Marketing Transformation
- Corporate/Internal & Community Engagement
- Conservation Achievements