



INFORMATION REPORT

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| TO: | Mayor and Members General Issues Committee |
| COMMITTEE DATE: | February 21, 2017 |
| SUBJECT/REPORT NO: | Estimate of Savings Attained from Energy Efficiency Projects (PW16074(a)) (City Wide) (Outstanding Business List Item) |
| WARD(S) AFFECTED: | City Wide |
| PREPARED BY: | Tom Chessman Manager, Energy Initiatives (905) 546-2424, Extension 2494 |
| SUBMITTED BY: | Geoff Lupton Director, Energy, Fleet & Traffic Public Works Department |
| SIGNATURE: | |

Council Direction:

On September 14, 2016 Council directed that Energy, Fleet and Traffic staff provide their best estimate of the savings attained from Energy Efficiency projects prior to the submission of the 2017 Public Works Department Operating Budget.

Information:

Budget setting is performed by the client group or end use departments. Guidance is provided from Energy staff through Finance on future rate setting expectations. Energy efficiency projects are used to reduce consumption or energy use to mitigate against rising energy costs and to achieve the City's corporate goals for energy and emission reductions as outlined in the Corporate Energy Policy.

For 2016, the total estimated energy savings, avoided costs and incentives are projected at \$11.5 million. Actual or final energy savings results are generally reported to the Public Works Committee as part of the City's Annual Energy Report usually after the first quarter of the following year. This is to allow for completion of year-end financials and for the City to receive all final utility billing (typically by the end of February). This also allows staff time to receive and analyse all relevant information for compiling the Annual Energy Report (for 2016 in this case). This year staff will also be providing a 10 year in review report to the Public Works Committee on the City's achievements and results of its corporate energy program. Table 1 - 2016 Estimated Energy Savings, Avoided

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Costs & Incentives provides a breakdown of the projected energy savings, avoided costs and incentives for 2016, by category and by levy and rate budgets.

Table 1 - 2016 Estimated Energy Savings, Avoided Costs & Incentives

| Energy Savings Category | Total |
|----------------------------------|--------------|
| Energy Conservation & Incentives | \$6,711,896 |
| Utility Rates & Cost Avoidance | \$4,682,209 |
| Cost Recovery | \$343,603 |
| 2016 Totals (*Estimated) | \$11,495,432 |

*Year end data is estimated at the time of writing this report.

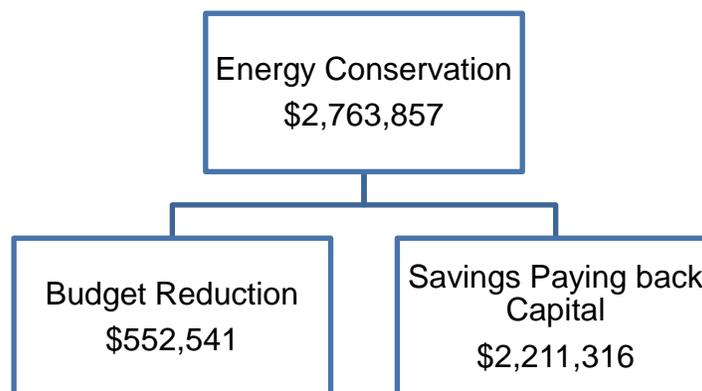
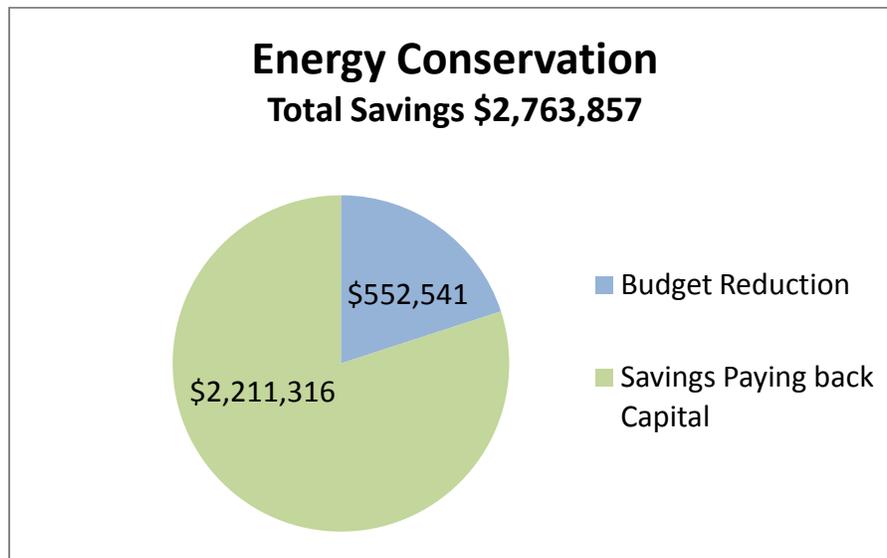
Energy Conservation & Incentives

Savings under this category are classified by those savings achieved from the implementation of energy efficiency measures, equipment and processes that lead to lower energy consumption and includes any financial incentives received for the energy efficient project(s). Many of the City's energy efficiency projects are eligible for a variety of financial incentives from our utility providers such as Horizon Utilities (now Alectra), Hydro One, Union Gas and from the Independent Electricity System Operator (IESO).

The Energy Conservation & Incentives estimated for 2016 are \$6,711,896. This is broken into two categories; the first is Energy Conservation which is estimated at \$2,763,857. The second category is for incentives, which is a total of \$3,948,039. Of note the City's, LED (Light Emitting Diode) street lighting retrofit project received a financial incentive of \$3,867,990.

Of the estimated \$6,711,896 million in savings from energy conservation and incentives, the estimated 2017 budget reduction from energy efficiency projects represents a reduction of 5,525,414 kilowatt hours (kWh's) or \$552,541 in savings at current average electricity rates. There is no provision made for increased savings as a result of year over year electricity rate increases with these projects. The remainder of the energy conservation savings are used to repay monies borrowed to fund designated projects. The following graph, titled Energy Conservation Breakdown illustrates how the budget is impacted and what portion of the savings is being used to repay capital.

Graph 1 – Energy Conservation Breakdown



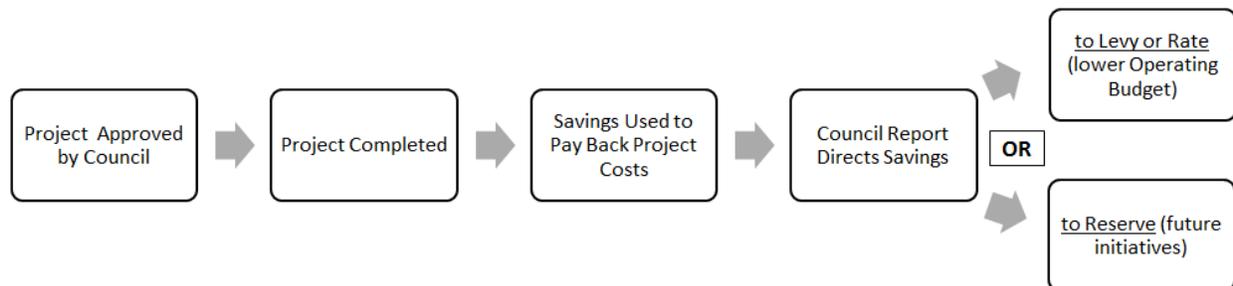
The City funds its energy efficiency projects in two ways, either from the capital budget or by borrowing the funds and using the energy savings to pay back project capital (with interest) to various Cityreserves. Project incentives are also used in one of two ways, to pay back capital borrowed for a project or they are deposited in the City’s Energy Reserve.

For 2016, the incentives received were used to payback or pay down capital funds borrowed to fund the projects. All of the energy efficiency projects and funding are approved by Council on a case by case basis. The majority of the projects received

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approval from Council to finance projects by utilizing funds available from various Reserves thus the repayment of the funds incurs interest charges. In these cases once the capital and interest has been repaid the savings can be directed to reduce operating budgets or directed to a reserve to fund future initiatives(see Graph 2 – Savings Directed by Council Reports). Some energy efficiency projects received funding through the City’s Capital Planning process thus no repayment is necessary.

Graph 2 – Savings Directed by Council Reports



Utility Rates & Cost Avoidance

Savings under this category are classified as the avoidance of costs that would have been incurred had no action been initiated by the City. Actions include procurement plans and strategies such as commodity hedging and optimizing utility rates such as switching rate classes to benefit from Global Adjustment (GA) cost reduction.

Utility Rates and Cost Avoidance represents a substantial piece of the annual cost avoidance total. As listed in Table 1 the utility rates and cost avoidance savings for 2016 are estimated to be \$4.68 million (Levy \$1.28 M /Rate \$3.40M).Table 2that follows illustrates the monthly total GA avoided costs.

Several years ago City staff, working with Horizon Utilities was able to move its largest electricity accounts from a standard rate structure (Class B rate) to a new rate (Class A rate). By limiting electrical use during peak demand times, Class A consumers can reduce the costs associated with the provinces GA rate. Consumers who are able to lower their electricity peak loads during peak days result in lower GA costs due to the methodology used by the Independent Electricity Service Operator (IESO) to calculate their GA costs.

Electricity peak day tracking is an internal process used by staff to track demand forecasts on a daily basis and communicate out to City sites when a peak demand day is expected. Select Water Operations and Corporate Facilities (in particular Class A sites) can take steps to reduce their energy usage (demand) during peak times. It has the potential to lower the site’s calculated portion of the GA and to decrease costs as hourly prices tend to also peak during high demand times.Graph 3 – Global Adjustment

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Estimated Avoided Costs in 2016 illustrates the actions taken by staff to mitigate the GA on peak days.

Energy reduction is always valuable in controlling costs across all rate classes. Reduction also helps to mitigate increases on the utility rates.

Graph 3 – Global Adjustment Estimated Avoided Costs in 2016

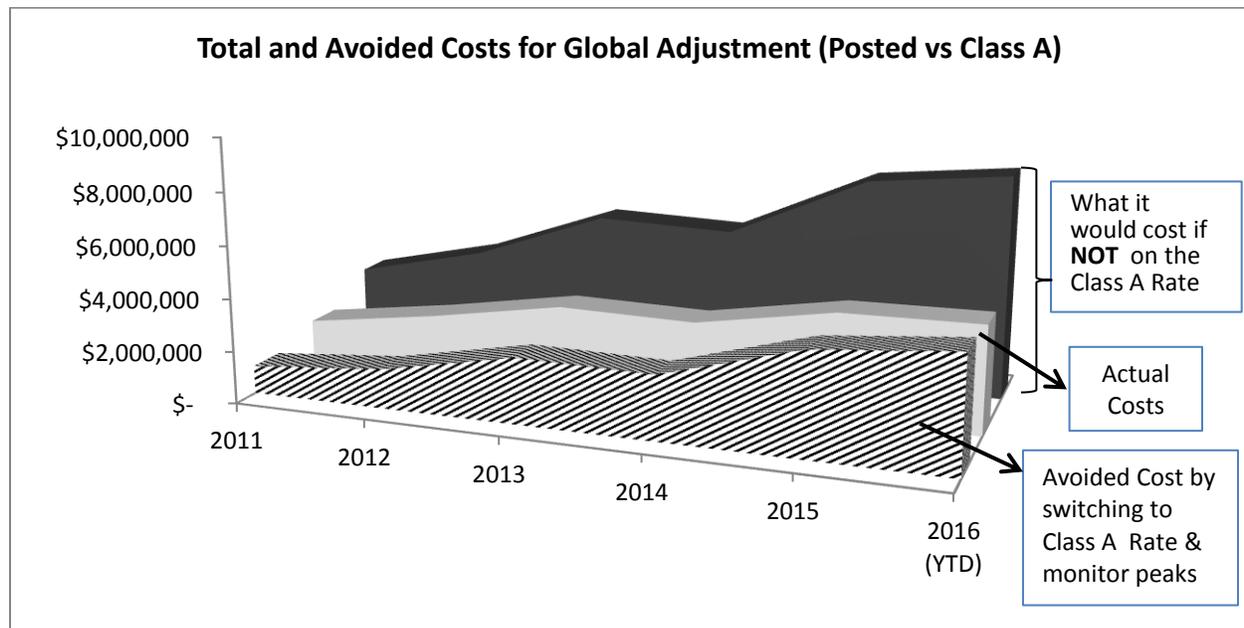


Table 2 – 2016 Global Adjustment Monthly Summary outlines the specific monthly impact of the Class A Rate benefit compared to the standard rate we would be charged had we not made these changes. Listed on Table 2 are the sites that currently get the Class A rate.

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Table 2 – 2016 Global Adjustment Monthly Summary (applies to 900 Woodward Ave, 850 Greenhill, 1579 Burlington St, First Ontario Centre and the Central Utilities Plant)

| 2016 | Standard Global Adjustment Charge | Actual Global Adjustment Charge | Avoided Costs (Savings) |
|-------------------|--|--|--------------------------------|
| Jan | \$776,233 | \$377,884 | \$398,349 |
| Feb | \$772,140 | \$375,432 | \$396,707 |
| Mar | \$871,375 | \$395,353 | \$476,022 |
| Apr | \$859,974 | \$384,949 | \$475,025 |
| May | \$867,928 | \$374,395 | \$493,533 |
| Jun | \$740,387 | \$351,294 | \$389,093 |
| Jul | \$706,260 | \$362,627 | \$343,633 |
| Aug | \$586,459 | \$324,536 | \$261,922 |
| Sep | \$708,518 | \$357,416 | \$351,102 |
| Oct | \$824,651 | \$392,782 | \$431,870 |
| Nov | \$764,258 | \$397,458 | \$366,801 |
| Dec | \$654,780 | \$356,631 | \$298,148 |
| GrandTotal | \$9,132,963 | \$4,450,756 | \$4,682,207 |

Cost Recovery

Savings under this category are classified as the costs recovered due to the City’s continuous efforts in monitoring and analysing its utility accounts. Recoveries can be attributed to adjustments made from billing errors, billing anomalies or rate corrections. Recoveries to date in 2016 amount to \$343,603, with the single largest recovered amount of the year being approximately \$220,000. The amounts recovered are managed according to guidelines in the Corporate Energy Policy. These recoveries are deposited in the City’s Energy Reserve.

Budget Setting Process

Budget settings performed by the client end use departments. Guidance is provided from Energy staff through Finance on future rate setting expectations. Often the energy savings from projects are mitigated in the budget due to rising utility costs. However the value of the energy efficiency projects are properly identified and tracked in the Annual Energy reporting process with actual energy intensity values (energy usage per square foot) and avoided costs, in order to provide context and magnitude of the projects.

Projects are often repaid from energy savings; therefore budgets may not be immediately reduced until the project has paid back the initial capital and interest charges. It is also important to note the definitions of the terms savings and avoided costs, especially as it relates to the budget process. Avoided costs occur when an action prevents a future cost. Energy projects compare the do nothing scenario against

the action of completing the energy efficient project. The resulting difference is avoided costs – sometimes also referred to as savings.

Other Impacts to Utility Budgets

When providing guidance on future utility costs the Energy Office considers impending legislative and market changes. For 2017, the introduction of Cap and Trade requirements in Ontario has an impact on all natural gas consuming accounts of approximately \$0.045 per meter cubed. This has already been built into the 2017 budget submission.

Weather can also have an impact on utility costs. Hot summers (increased cooling degree days) will increase costs in electricity for cooling and cold winters (increased heating degree days) will increase costs in natural gas for heating. This is not something that can be budgeted but does directly affect actual costs each year.

It should be noted that the collaborative efforts of many departments across the City are working to reducing the impact of increasing rates on utility and fuel budgets by actioning many of the policies set out in the Corporate Energy Policy.

Another key metric that is referenced in the Corporate Energy Policy and reported in the Annual Energy Report is energy intensity. At year end 2015 Corporate energy intensity was reduced by 19% as compared to the same value in 2005 and was down 4% from 2014 (full year data was not available to properly calculate this value for 2016 at the time of writing this report). This highlights the fact that consumption is being lowered as part of the Corporate Energy Policy targets, even though unit costs are going higher.

The 2016 Annual report will reflect the actual full calendar year data, without estimates and assumptions that were used in this report. For additional details on past Annual Energy reports please refer to www.hamilton.ca/energy.

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