CITY OF HAMILTON

PUBLIC WORKS DEPARTMENT
Transportation, Energy & Facilities Division

TO: Chair and Members
    Public Works Committee
WARD(S) AFFECTED: CITY WIDE

COMMITTEE DATE: January 25, 2010

SUBJECT/REPORT NO:
Request for Additional Energy Staff (PW10006)

SUBMITTED BY:
Gerry Davis, CMA
General Manager
Public Works Department

PREPARED BY:
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SIGNATURE:

RECOMMENDATION
(a) That Council approve the hiring of five new energy staff for the Office of Energy Initiatives (OEI) on a contract basis, funded from the Energy Reserve or through Project Cost Recovery with NO Tax Levy impacts;
(b) That these new energy staff be hired for a contract term of three years;
(c) That staff report back to Council prior to the completion of the contract term on the cost and benefits realized with these new positions.

EXECUTIVE SUMMARY
At the August 11, 2009, Committee of the Whole, staff was asked by Council to present a rationale for additional staff for the Office of Energy Initiatives as part of the 2010 budget process. At the November 30, 2009, Public Works Committee meeting staff provided the Committee with a presentation titled “Proposal / Rationale for Additional Energy Staff - Office of Energy Initiatives, Transportation, Energy & Facilities”. Staff was directed by the Committee to report back with a formal report for its consideration. Staff was also asked to provide details on the staff functions and an explanation of avoided costs versus direct savings.
This report will outline the rationale and benefits associated with the addition of five new energy staff to further assist and support the City’s Corporate Energy Policy and Council’s Strategic Plan. There have been many changes to the energy market in the last ten years, none as great as the introduction of the Province’s Green Energy Act and policies to facilitate the implementation of a Smart Grid.

With the new Green Energy Act, and the continued evolution of world energy markets the City of Hamilton is well positioned to take advantage of these situations and to maximize the financial opportunities available. Other opportunities include improving the energy efficiency of our infrastructure using full life-cycle costing for capital projects; managing market volatility and minimizing budget risk with respect to the City’s energy commodity costs; achieving environmental emission reductions and creating other benefits such as job creation, green innovation and a culture of excellence.

As evidence of the changes taking place in Ontario’s Energy Market, recently at a Toronto Board of Trade speech, Howard Wetston Q.C., Chair of the Ontario Energy Board said:

“The Green Energy Act is an innovative legislative approach that transforms the scope of Ontario’s energy policy, expanding it to attract new investment, create new green economy jobs and better protect the climate. A key component of this new approach is a feed-in tariff (FIT and MicroFIT) regime that will encourage new investment in renewable energy generation.”

Mr. Wetston paraphrased a recent Premier McGuinty presentation which said:

“Our world is changing.
Old world, low dollar.
New world, high dollar.
Old world, low energy costs.
New world, higher energy costs.”

This means the new green energy regime will bring higher energy costs, due to the higher costs associated with renewable energy technologies and significant investment required to improve Ontario’s transmission and distribution grids. The associated societal benefits of the Green Energy Act, predicted by the Province include: reduced emissions, a cleaner environment and job creation for a green economy and more.

With the new Green Energy Act, there will be opportunities for the City to participate in the Ontario Power Authority’s (OPA) FIT and MicroFIT programs for renewable energy, demand response programs and new higher incentive programs to encourage more significant energy conservation projects and cost savings.

Recently, the General Manager of Public Works and Max Cananzi, President and CEO of Horizon Utilities met to discuss the Green Energy Act and opportunities for working together. Mr. Cananzi outlined how, over the next five years, the new Green Energy Act legislation provides electrical utilities with substantial new reduction targets. Of these, 7-8% is to be achieved through energy conservation and demand management (CDM) efforts. Utilities are moving from voluntary participation in CDM programs to mandatory
participation. This will require significant effort to encourage deeper CDM market penetration. As a result, staff expect significant increases in programs offered and funding opportunities over the next five years. This presents the City with an excellent opportunity to improve our energy efficiency, reduce greenhouse gas (GHG) emissions and implement projects that offer great financial return.

To fully realize these opportunities, the City will require additional resources which have the specific expertise to support the energy function Corporately by assisting key city departments, boards and agencies in maximizing the energy efficiency of their projects while still meeting the financial objectives of their infrastructure projects.

One example of how the Energy Office benefits in working with other departments to enhance energy and cost savings opportunities is the recent work done in conjunction with the Environment & Sustainable Infrastructure Division (Water and Wastewater Engineering team) on the High Lift Pumping Station (HLPS) at Woodward. This project is being funded through the Infrastructure Stimulus Fund (ISF). By supporting the expertise of Environment & Sustainable Infrastructure staff with that of our Energy staff, early analysis indicates a potential energy reduction of 25-30%, which will save an estimated $600,000 to $700,000 in energy costs annually. Without the combined efforts the project would not have achieved the energy savings and operational improvements expected when the project is completed sometime in 2011.

By adding additional energy staff on an ongoing basis to the Water and Wastewater renewal program over the next several years, opportunities as described above can be achieved.

A second cooperative example is the Energy Office providing assistance to our Recreation Division regarding the new North Wentworth Arena. In this case energy staff assisted Recreation staff in looking at more energy efficient options in the project design. When constructed, the project will use 58% less energy than the base design thereby saving or cost avoiding approximately $150,000 in annual utility costs.

The New Staff Functions

Awareness of the Corporate Energy Policy has expanded throughout City Departments resulting in many requests for information, project help, utility budget help, fuel, renewable energy opportunities, community energy assistance, organizational changes and more. To fulfill the mandate of the Corporate Energy Policy, and take advantage of the opportunities provided by the Green Energy Act, additional qualified staff are required.

As the City’s energy program has evolved over the last few years, projects which have been assisted by the expertise of the Energy Office bring the greatest return to the City in terms of energy efficiency, emission reductions, financial return and incentive funding. When energy staff is not involved in the process, existing department staff in general (with some exceptions) do not have the expertise to take full advantage of energy reduction opportunities. What has been observed is that Project Managers need to be educated and encouraged to evaluate energy efficient alternatives properly, so that information can be provided to make informed decisions and also to ensure that staff
take advantage of and receive the lucrative incentives available when implementing new energy efficient options.

New energy staff would focus on four primary areas:

1. The first is in improved reporting on energy results and key performance indicators to Council and to individual Divisions so that informed decisions can be made and a climate of accountability for energy costs can be created. Reporting would also provide a focus on benchmarking both internally and with other municipalities, to gauge performance and evaluate successes as a leader in energy management.

2. The second area is to provide more energy expertise to support major infrastructure projects and capital planning for the City’s major energy users over the next several years (e.g. Environment & Sustainable Infrastructure and Community Services). Added support in this area will ensure the City achieves the greatest return in terms of energy efficiency and financial performance of infrastructure projects.

3. The third area is for specific focus on renewable energy technologies and opportunities under the Ontario Power Authorities (OPA’s) FIT and MicroFIT programs. This function would also evaluate opportunities for participating in OPA’s Demand Response programs which could generate millions in dollars.

4. The fourth area is adding the skills and expertise required for metering, sub-metering and controls systems in the City. This skill set is presently lacking and is necessary for future cost and operational control. The City’s current building automation system is now ten years old and will need to be replaced in the next few years. Expertise in this area will ensure the City makes the best decisions for future systems. Further details on specific functions are provided later in this report.

The addition of these staff is expected to provide the City with a minimum net benefit of $6 million in costs savings and avoided costs over the next five years.

**Energy Office and Energy Savings**

To date the City’s corporate focus on energy has proven to be an excellent return on investment through direct energy cost savings and avoided cost savings on both the levy and rate budgets. Cumulatively the City has achieved over $13.47 million in savings and avoided costs as of September 30, 2009, as illustrated in the following graph.

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**Vision:** To be the best place in Canada to raise a child, promote innovation, engage citizens and provide diverse economic opportunities.

**Values:** Honest, Accountability, Innovation, Leadership, Respect, Excellence, Teamwork
The following table provides a breakdown of savings by category and levy or rate benefit.

<table>
<thead>
<tr>
<th>Category</th>
<th>Rate</th>
<th>Levy</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Gas Hedging</td>
<td>$290,219</td>
<td>$2,103,906</td>
<td>$2,394,124</td>
</tr>
<tr>
<td>Energy Conservation</td>
<td>$0</td>
<td>$2,159,514</td>
<td>$2,159,514</td>
</tr>
<tr>
<td>Rate Structure Savings</td>
<td>$2,934,860</td>
<td>$2,647,231</td>
<td>$5,582,091</td>
</tr>
<tr>
<td>Incentives/Funding</td>
<td>$0</td>
<td>$658,882</td>
<td>$658,882</td>
</tr>
<tr>
<td>Billing Recoveries</td>
<td>$235,375</td>
<td>$2,444,816</td>
<td>$2,680,191</td>
</tr>
<tr>
<td><strong>Totals:</strong></td>
<td><strong>$3,460,454</strong></td>
<td><strong>$10,014,348</strong></td>
<td><strong>$13,474,802</strong></td>
</tr>
</tbody>
</table>

**Explanation of Savings**

Energy cost savings and avoided costs are reported cumulatively into three areas:

- **Levy Benefits** - are benefits or reductions reflected in the tax base;
- **Rate Benefits** - are benefits or reductions to the water rate base;
- **Corporate Total(s)** - are the total combined savings and benefits (levy plus rate).
- **Avoided Costs** - refers to the total cost avoided by the City through a reduction in energy rates. It is the capital or expense that would have had to be paid if the project or action did not proceed.

**Example:** In 2006 the City was entering into the Association of Municipalities of Ontario (AMO) natural gas program. The Manager of the OEI withdrew the City from the AMO program, and the Energy Office proceeded to purchase natural gas through their own expertise under the newly created Energy Commodity Policy which was approved by
Council. The Avoided Costs the City saved through this initiative is the difference between the cost the City would have paid through the AMO program and the actual cost that the City has paid for their natural gas purchases. This difference since this initiative began has so far accounted for $2.17 million in savings over the AMO program, or avoided costs.

- **Direct Savings** - are savings that *directly benefit* the City’s bottom line through levy or rate savings, such as incentives and billing recoveries.

  *Examples:* The City pays monthly invoices to our local utilities for utility account charges through Accounts Payable. The OEI investigates and find some incongruence on certain utility accounts and determines that the historical billing has been incorrect for what could be a variety of reasons. The OEI presents their case to the Utility Company, and if the City’s case is correct, the Utility sends a cheque to the City for the amount of the over-billing and overpayments. The OEI have investigated a number of accounts and cases such as this and have recovered over $2.68 million in overpayments to date.

**FINANCIAL / STAFFING / LEGAL IMPLICATIONS**

**Financial:** The five year projected net benefit to the City with the addition of five new energy positions is estimated at $6 Million. The cumulative savings versus staffing costs are illustrated in the graph below.

The combined net benefit for the Office of Energy Initiatives as a whole is projected in the range of $14 to $16 million. The primary variation is due to unpredictability of commodity markets over the next five years. Without the five new positions to assist the OEI team, the range of net benefit of the Energy Office reduces to $8 to $10 million. The new positions help to enhance the overall delivery of results.

**New Energy Staff Cumulative Cost/ Benefit**

![Projected Cumulative Costs vs. Savings Benefits](image)
Graph Notes:
- Based on a June 2010 start.
- Based on a May 2015 finish.
- Cumulative staff costs of approximately $495,000 escalated at 2.5% annually.

Staffing: Specific functions or expertise for each of the five proposed energy staff are outlined below:

1. **Energy Database Maintenance**
   This position’s function is for the day-to-day data input and management of the City’s Utility Manager Database. Responsibilities include: coordinating all utility account data with the proper facility sites, to acquiring and loading historical utility billing data into the database, to grouping and tracking energy costs within the database. This position will be extremely important for tracking energy projects within the database, from energy consumption savings, energy cost savings to GHG emission reductions as well. This position is primarily a support role to our existing utility staff. This will allow the Energy Office to more fully realize the savings opportunities in terms of billing recoveries and reporting, benefits that without this position cannot be achieved through the current workload.

   This position will also be trained as a backup to the Archibus Database Administrator within the Corporate Facilities group. This is important for two reasons: one is the gathering and importing facility data into the City’s Energy Management Software System for reporting on KPI’s. The second is that the City does not currently have a backup person trained in Archibus. This position will also assist with reporting and billing for sub-metered accounts and will be instrumental in helping to create energy reports required by Managers.

2. **Capital Renewal & Retrofit Projects**
   This position’s primary function is on capital renewal projects, both for new construction and retrofit projects. This is a senior position based on the level of expertise needed to work with various Divisions/Departments such as Environment & Sustainable Infrastructure, Recreation, Housing and both Community and Corporate Facilities to provide energy engineering expertise. It is expected that the majority of workload will be assisting Environment & Sustainable Infrastructure (Water & Wastewater Operations) on the construction / expansion projects and demand response opportunities for Water & Wastewater over the next several years. Water & Wastewater operations already represent close to 40% of the City’s electricity costs and is expected to almost double its electrical needs at Woodward over the next few years. Having energy expertise familiar with Water & Wastewater operations will be extremely important in maximizing energy efficiency and controlling utility costs.

3. **Metering and Controls**
   The Metering and Controls position will be responsible for all energy metering and sub-metering throughout all City facilities, as well as ensuring that the City’s Building
Automation System are in place to automatically monitor and supply information on energy use and consumption in City facilities.

The City’s existing controls system will be ten years old in 2011 when the City’s maintenance contract is up for renewal. It will be extremely important to have controls and metering expertise within the City, given the need to update the City’s controls software to a more modern system. New user friendly features will allow web access for operators and building staff to have ongoing information on what is happening in their building. Access to information and education could cut building HVAC consumption by 10%. The second priority for this position will be to expand the metering and sub-metering system for purposes of billing (e.g. district cooling) and greater operating monitoring and controls e.g. Water & Wastewater Operations for demand response.

4. **Renewable Energy & Demand Response**

This position’s function is to investigate and coordinate lucrative opportunities under the OPA’s Demand Response programs. A demand response program with contractual obligations requires participants to reduce load during certain periods of the year. Participants make themselves available during scheduled hours for potential notices to reduce load, through controlling electrical usage. Participants can select to make themselves available to reduce load up to 100 hours or 200 hours per year.

The OEI’s initial estimate is that the Demand Response program itself could yield $1,000,000 in annual income from the OPA. This position would coordinate our renewable generation, backup generation, operational changes and peak shaving opportunities within City facilities.

This position will work on all new renewable energy opportunities on City owned facilities and property (implementing the Ontario Power Authority’s FIT and MicroFIT programs). These projects will enhance the City’s position as a green municipal leader. This position can also assist Economic Development in providing insight and expertise for attracting new green businesses to the City. The OEI is currently assisting Economic Development with a number of inquiries in Hamilton. A key component of solar energy projects under the FIT and MicroFIT programs are a requirement for a minimum Canadian manufactured content. This may present opportunities for Hamilton to attract new manufacturing.

5. **Capital Renewal & Retrofit Projects**

This position would focus on capital renewal and specialized retrofit projects. In the City Environment & Sustainable Infrastructure (Water & Wastewater operations), Corporate Facilities and Community Services consume over 85% of the City’s energy. This position will enhance the focus and coverage for projects in Facilities and Community Services, where coverage is needed now. In some case handling projects directly or assisting as a team member on other major projects. This is to handle the extra workload in facilitating energy projects from other departments. The OEI has been receiving numerous requests for help from other departments in the energy design of
their projects, but we need additional resources to be able to provide this guidance throughout the City’s departments.

Legal: None

HISTORICAL BACKGROUND

- In 2005 Hamilton City Council approved the concept of an energy office (now the Public Works, Office of Energy Initiatives) to be created to formalize and centralize responsibility for energy management in the City by focusing on how and where the City of Hamilton is spending money on energy and to look for ways to save and reduce energy consumption.

- The Office of Energy Initiatives (OEI) was formally established in May 2006 with the hiring of the Manager on a two year contract. In January and March of 2007, two Senior Project Managers joined, also on two-year contracts. In November 2007, the City’s Corporate Energy Policy was approved, along with approval for the three existing staff and two new Project Managers, hired in April 2008 to become permanent full time staff.

- At the August 11, 2009, Committee of the Whole meeting an Information Report titled Corporate Energy Report - Year End 2008 was received by Council. This report (dated July 13) outlined the corporate energy savings and avoided cost savings as of the year end 2008 which had exceeded $10 million dollars ($9.2 net) and that overall, the City’s corporate energy consumption or usage reductions was 3.3% during this time period. Further to this report, staff was asked by Council to present a rationale for additional staff for the Public Works - Office of Energy Initiatives as part of the 2010 budget process.

- At the November 30, 2009, Public Works Committee meeting staff provided the committee a presentation titled “Proposal / Rationale for Additional Energy Staff - Office of Energy Initiatives, Transportation, Energy & Facilities”. Further to the presentation staff was directed by the Committee to report back with a formal report for its consideration.

POLICY IMPLICATIONS

Corporate Energy Policy - hiring these staff will support measures required to allow the City to meet its target of 20% reduction in energy intensity by 2020 or 1.5% per year. It will also allow additional staff to focus on enhancing energy conservation and renewable technologies in the City.

Vision 2020 - Energy savings through energy conservation and demand management is a primary driver for reducing greenhouse gas emissions in the City and meeting our 2020 targeted commitments. As we reduce our energy use we also reduce our emissions.
Innovate Now - Supports the Public Works Business Plan in terms of being a leader in the greening and stewardship of the City and engaging people and staff to find solutions to systemic issues.

**RELEVANT CONSULTATION**

The City’s Corporate Energy Steering Committee - Members were asked to provide comments / suggestions on adding additional staff to the Office of Energy Initiatives. Committee members who provided comments are very supportive of adding additional energy staff, particularly if it can do more to improve their area’s energy efficiency.

**ANALYSIS / RATIONALE FOR RECOMMENDATION**

The addition of the five new energy staff will enhance the City’s bottom line by a minimum net $6 million, over and above the value we would save with existing staff and collectively enhance the Energy Office’s performance over the next five years and providing important assistance in the following areas:

1. Achieve energy reductions outlined in the City’s Energy Policy (20% by 2020).
2. Improved environment - reduced emissions (Vision 20/20).
3. Levy and Rate benefits - energy savings / cost avoidance.
5. Improved metering, monitoring and reporting capabilities.
6. Increased education capabilities for staff and the community.
7. Corporate/ Departmental support and energy project expertise.
8. Infrastructure/ Capital improvements - life-cycle costing.
9. Positive contributor to the City’s Triple Bottom Line.
10. Reflects principles aligned with City’s and Public Works’ goals and strategies.

**ALTERNATIVES FOR CONSIDERATION**

If Council decides not to hire the additional energy staff, it will limit the OEI’s ability to take advantage of new opportunities associated with the Green Energy Act and enhance energy conservation programs over the next several years. Decisions will need to be made where the existing resources can best be allocated.

**CORPORATE STRATEGIC PLAN**


**Skilled, Innovative & Respectful Organization**

- A culture of excellence
- A skilled, adaptive and diverse workforce, i.e. more flexible staff
- More innovation, greater teamwork, better client focus
Opportunity for employee input in management decision making
Council and Senior Management Team are recognized for their leadership and integrity

Financial Sustainability
- Financially Sustainable City by 2020
- Effective and sustainable growth management
- Delivery of municipal services and management capital assets / liabilities in a sustainable, innovative and cost effective manner
- Full life-cycle costing for capital
- Address infrastructure deficiencies and unfunded liabilities
- Achieves energy and environmental reductions

Intergovernmental Relationships
- Acquire greater share of Provincial and Federal grants (including those that meet specific needs)

Growing Our Economy
- Competitive business environment
- A skilled and creative labour pool that supports new employers

Environmental Stewardship
- Reduced impact of City activities on the environment
- Aspiring to the highest environmental standards

Healthy Community
- Plan and manage the built environment

APPENDICES / SCHEDULES
None