



City of Richmond

Report to Committee

To: Public Works & Transportation Committee
From: John Irving, P.Eng, MPA
Director of Engineering
Re: Energy Management Program Update

Date: April 2, 2009
File: 10-6125-05-01/2009-Vol 01

Staff Recommendation

That the "Energy Management Program Update" report from the Director of Engineering dated April 2, 2009 be received for information.

Handwritten signature of John Irving

John Irving, P.Eng, MPA
Director Engineering
(4140)
Att 1.

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ROUTED TO: CONCURRENCE
Sustainability Office Y [checked] N []
Policy Planning Y [checked] N []
CONCURRENCE OF GENERAL MANAGER
[Signature]
REVIEWED BY TAG YES [checked] NO []
REVIEWED BY CAO YES [checked] NO []

Staff Report

Origin

The purpose of this report is to update Council on the progress and accomplishments of the City's energy management program for 2008 and identify next steps in the City's energy management program.

Background

About the City of Richmond's Energy Management Program

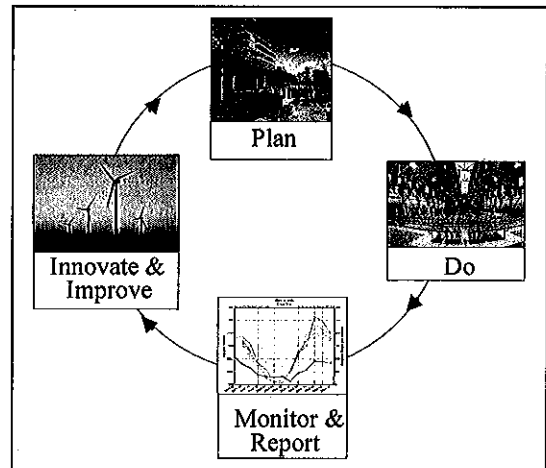
The City of Richmond has had a long history in energy management with initial activities beginning in the early 1990s. The major focus of the program has been to increase the energy performance of city assets, predominately city facilities. In the past few years, the program has been broadened to include consideration and initiate support for all major energy consuming corporate assets (e.g., lighting, pump stations, etc.) through partnership initiatives with other departments.

In general, the City's Energy Management Program (EMP) includes the following major elements:

1. the City's High Performance Building policy which establishes energy and other performance standards for new corporate facilities
2. an energy retrofit program to increase energy efficiency in existing buildings
3. energy management support to increase energy performance in other corporate assets
4. energy awareness initiatives.

The City's EMP is based on a life-cycle costing approach which evaluates energy performance and costs throughout the entire life of a building and other assets. By considering initial capital costs of investments in concert with operational costs, the City has been able to make smart investment decisions which have resulted in significant lower energy consumption and cost. Operational savings are re-invested into future capital projects. The City has also been able to leverage significant external funding on an annual basis. With the level of savings realized and external funding secured, the City's energy retrofit program generally operates as a self-reliant program.

Richmond's EMP program is based on a continual improvement model with feedback loop incorporating four core management phases: plan, do, monitor & report, and innovate & improve.



Analysis

City Energy Management Performance - 2008 Achievements

In 2008, the City's energy management program achieved:

- a 2% reduction in energy consumption avoidance (equivalent to approximately 1.2GWh/year)
- a reduction in greenhouse gas emissions of 220 CO₂e(t)¹
- approximately \$430,000 in avoided cost escalation.

Key action deliverables are summarized in Table 1 (attach).

Next Steps

The Energy Management Program (EMP) had a strategic shift in 2008 to become more decentralized and provide support services to various City departments. In recent years, the EMP has also shifted to encompass energy management at both the corporate and community level. In 2009, the City's EMP will further evolve to:

- integrate greater consideration of energy sourcing and greenhouse gas (GHG) emission reduction in overall planning and project investment decision-making;
- augment the strong projects-based approach with additional strategic planning in energy management and policy development (e.g., establishing short/mid-term targets pertaining to overall consumption, use of renewable energy and GHG emission reduction, identifying short/mid-term priority action, etc.); and
- place greater focus on community-wide energy management planning and projects and develop further partnership with the School District on energy reduction initiatives.

In this manner, the objectives of the EMP will be expanded to be better address all aspects of energy management, aiming to:

- reduce energy consumption, GHG emissions and operational costs; and
- improve stability and decrease reliance on non-renewable forms of energy.

A key initiative being undertaken in 2009 is the development of a Community Energy and GHG Reduction Strategy. This work is being undertaken as a partnership initiative among Engineering, Policy and Planning and the City's Sustainability Office. The strategy will:

- assist the City in advancing community-wide energy initiatives such as District Energy Utility systems;
- develop private sector greenhouse gas reduction targets and policies to incorporate into the City's Official Community Plans as required by new provincial legislation;
- identify opportunities for creating an energy secure and efficient community;

¹ These numbers represent energy savings through energy efficiency investments. Overall, the City increased total energy consumption by 0.3 GWh in 2008. As the City's assets increase, so does its energy consumption. Energy consumption in 2009 is expected to increase by a larger percentage with the addition of the new corporate facilities.

- establish overarching policy and targets for advancing energy management in a manner which supports the transition towards a more sustainable community.

The majority of funding (i.e., 70%) for this Community Plan has been secured through external sources. Remaining funding is available within existing budgets. It is anticipated that the Community Energy and GHG Reduction Plan will be provided to Council for consideration in early 2010.

On a corporate front, the EMP will continue to aspire to achieve a working target of a 2% energy consumption avoidance in 2009 based on resources available through program self-financing. Anticipated projects to be completed in 2009 are predominately lighting efficiency improvements in a variety of City facilities and sport fields. The 2009 program will also:

- continue to advance the City's Neighbourhood District Energy initiative
- explore opportunities to increase use of renewable energy sources in city assets (e.g., solar systems for meeting heating requirements for City aquatic facilities) and new technologies to capture and use waste energy (e.g., high-efficiency in-line power generating turbines to capture waste energy in drinking water mains), and
- undertake collaborative efforts with the City's Sustainability Office and other City departments to undertake initiatives necessary to meet the City's GHG emissions obligations under the Climate Action Charter².

Financial Impact

There is no financial impact as a result of this report.

Conclusion

The City's Energy Management Program has had a long history of success in minimizing cost impacts to the City and reducing the City's energy consumption footprint. The City's Energy Management Program will continue its evolution in 2009, placing greater emphasis on corporate and community energy strategic planning and policy development and formally integrating with the City's greenhouse gas emission reduction objectives. These next steps in the program development build on the City's energy management successes to-date and advances the program forward with a broader agenda to better meet current City requirements and the challenges and opportunities ahead.



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² The City of Richmond is among over 170 BC municipalities who have signed the BC Climate Action Charter. The Charter is a non-binding commitment to achieve carbon neutrality in municipal operations by 2010, measure and report on community's greenhouse gas emissions and create a complete, compact, more energy efficient community.

Table 1 : City Energy Management Program – 2008 Key Initiatives

Management Areas	2008 Key Initiatives
Plan	<p>Energy Retrofit Planning</p> <ul style="list-style-type: none"> • 20 energy audits completed • 2009 energy retrofit plan developed • initiated negotiations for approximately \$480,000 in external grant applications to support 2009 energy initiatives
Do	<p>Building Capacity</p> <ul style="list-style-type: none"> • implemented energy awareness initiatives (e.g., Earth Hour) • secured \$430,000 in external grants to support 2008 energy initiatives <p>Reducing Energy Use</p> <ul style="list-style-type: none"> • leading-edge energy efficiency initiatives <ul style="list-style-type: none"> ○ Richmond Ice Centre Lighting ○ Minoru Arena Lighting • energy lighting retrofits at Watermania • assisted in energy efficiency projects and initiatives for other City service areas (e.g., Oval, IT, Public Works) <p>Increasing Financial Security & Stability</p> <ul style="list-style-type: none"> • \$430,000 in avoided cost escalation including: <ul style="list-style-type: none"> ○ \$258,000 in natural gas cost (\$54,000 through gas purchase contracts), and ○ \$172,000 in electricity cost
Monitor & Report	<p>Establishing Energy Monitoring System</p> <ul style="list-style-type: none"> • consolidated a corporate-wide energy asset inventory • developed web-based energy consumption monthly reporting system <p>Reporting Performance</p> <ul style="list-style-type: none"> • quarterly progress report to BC Hydro • energy retrofit project reporting • annual report to Council
Innovate & Improve	<p>Exploring New Approaches and Technologies</p> <ul style="list-style-type: none"> • Scoping and Feasibility Studies <ul style="list-style-type: none"> ○ neighbourhood energy utility initiative³ ○ community energy and sustainability planning, including participating on the City's Climate Change team • Pilot Projects <ul style="list-style-type: none"> ○ LEED- Complete: participated in national working group which created a rating checklist for evaluating performance of existing offices <p>Energy Management System Evaluation</p> <ul style="list-style-type: none"> • 2008 energy management system assessment report (third-party)

³ A separate progress update report on the Neighbourhood Energy Utility initiative will be provided to Council within the next 6 months.