

# Memo



**Date:** August 18, 2010  
**File:** 1310-40  
**To:** City Manager  
**From:** T. Barton, Parks & Public Places Manager  
**Subject:** Solar Demonstration Project, Fire Hall No. 1, Enterprise Way  
prepared with K. Bouw, Architecture Planner

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## **Recommendation:**

THAT Council approves the solar demonstration project at Fire Hall No. 1, Enterprise Way as part of the City's Solar BC commitment in 2010;

AND THAT all costs associated with this project, estimated to total \$12,000 to be funded from the Energy Management Reserve R011;

AND THAT Council directs staff to apply for the Natural Resources Canada Eco Energy Grant and the complimentary BC Solar Grant associated with solar thermal installations;

AND FURTHER THAT the 2010 Financial Plan be amended accordingly.

## **Purpose:**

On April 26, 2010, Council directed "staff to develop a business case for the feasibility of a solar demonstration project as a part of the City's Solar BC commitment for Fire Hall No. 1, Enterprise Way and directed staff to return to Council with a report for consideration."

## **Background:**

On March 31, 2008, Council endorsed an Energy/Carbon Management Plan directed at reducing both (a) energy consumption and (b) the environmental and climate change impacts of civic facility operations.

On March 8, 2010 Council approved the Sustainable Municipal Infrastructure Policy 352 with targets for achieving corporate carbon neutrality by 2012 and reducing greenhouse gas (GHG) emissions by 33% by 2020. This reduction is based on a 2008 baseline and must be achieved regardless of the expansion of infrastructure assets. An additional policy target was to achieve desired levels of service at the least life-cycle cost.

## Solar BC Commitment

The City has a commitment under the Solar BC Program to deliver a solar hot water demonstration project in 2010. Fire Hall No. 1, Enterprise Way was selected as an ideal site due to its high public visibility and on-going operational opportunities for GHG reduction.

## Solar Thermal Demonstration Project

Reevolution Consulting was engaged by the City to provide the design for the solar thermal system and to prepare a business case to demonstrate the associated cost savings. The design of the solar thermal demonstration project at Fire Hall No.1 seeks to offset a portion of the natural gas consumption of the building. The solar thermal system will provide hot water for the showers to the central fire-fighting crews. The design of the system will also allow the opportunity for monitoring of the success of the system in order to set a precedent for future installations.

The current domestic hot water heating system consists of an 80 (US) gallons water heating tank that uses natural gas as its primary fuel source. On average, the building consumes 153 gallons of hot water daily.

The proposed solar system includes two evacuated tube solar water heating panels located on the roof of the eastern portion of the building, above the carport and office area. The piping layout has been sized to allow for future expansion of the system.

### Energy Analysis

The system currently consumes approximately 71 GJ of natural gas annually. With the proposed solar thermal design, the two solar panels will be able to deliver 34 GJ of heat annually to the domestic hot water loop. The solar input energy amounts to a 48% decrease in natural gas consumption relative to domestic hot water heating.

The approximate cost of natural gas to heat the domestic hot water is \$852 annually. The proposed solar thermal system will provide 48% of the heating requirements, reducing annual natural gas consumption to 37 GJ for an annual cost of \$447, an annual savings of \$405 and an equity payback of 18 years when considering the cost of borrowing money and the predicted escalation rate of energy. The system will save 1890 kg of CO<sub>2</sub> per year, or the equivalent of removing 0.3 Ford Escapes from the road per year.

### **Financial/Budgetary Considerations:**

The estimated cost of the installation for this system is \$12,000. This cost includes all necessary equipment as well as roofing and support structures required. The expenditure is proposed to be funded from the Energy Management Reserve R011.

To help off-set the costs, the project will qualify for a total of \$4,163.63 in federal and provincial incentives. The project will qualify for an Eco Energy grant which is administered through NRCAN. The Eco Energy grant is expected to amount to \$2,081.82. At a provincial level, Solar BC will match the federal incentives received by Eco Energy for grant of \$2,081.82. The submission for both grants has been initiated by Reevolution Consulting. Final confirmation of grant approvals and amounts is expected by September 20, 2010.

Although the payback period is quite long for an energy savings project, staff are recommending that this small investment is justified to show leadership in solar thermal technology, to meet its commitment for a solar thermal demonstration project in a municipal building, and to identify operating and technical issues that would help reduce costs in future projects.

**Internal Circulation:**

M. Johansen, Manager, Building/Community Services  
K. Grayston, Director, Financial Services  
J. Shaw, Project Engineer, Utility & Buildings Project Management

**Considerations not applicable to this report:**

Legal/Statutory Authority:  
Legal/Statutory Procedural Requirements:  
Existing Policy:  
Personnel Implications:

External Agency/Public Comments:  
Community & Media Relations Comments:

Alternate Recommendation:

Submitted by:



T. Barton, Parks & Public Places Manager

Approved for inclusion:



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