

**Environment and Sustainability Standing Committee**  
**May 2, 2013**

**TO:** Chair and Members of Environment & Sustainability Standing Committee  
Original Signed

**SUBMITTED BY:** \_\_\_\_\_  
Jane Fraser, Planning and Infrastructure

**DATE:** April 8, 2013

**SUBJECT:** Solar City Pilot Program Update #1

**INFORMATION REPORT**

**ORIGIN**

December 11, 2012, Award and Initiation of Solar City Program, Regional Council Motion 11.1.1.

**BACKGROUND**

On December 11, 2012, Regional Council approved the launch of the Solar City Program, a program to encourage residents to adopt solar hot water technology that could be financed through a process similar to a Local Improvement Charge (LIC). This would be the first program of its kind in Canada.

Solar City is a very unique concept and is being implemented as a pilot program to assess the viability of the program before making any longer term commitments. Regional Council and the Environment and Sustainability Committee have asked for periodic updates on the progress of the pilot program goals. As articulated in the December 11, 2012, report:

***Goals of Solar City Pilot Program***

*Goals and objectives of the pilot would be to answer the following questions:*

- *Is the program financially self-sustaining, without impacting the non-participating HRM taxpayer?*
- *Are residents participating in sufficient numbers to justify?*
- *Is the program cost effective for homeowners?*
- *Are installations of high enough quality and quantity?*
- *Is the program simple enough to administrate effectively in HRM?*
- *Are there any risks to the municipality or homeowners that cannot be addressed thru contractual or program processes?*

## **DISCUSSION**

### ***Update #1:***

The Solar City Program has been ramping up smoothly to match the capacity of industry and HRM to effectively administer the pilot program. Several key milestones have been achieved during the last three months including:

#### **Administrative Milestones:**

- Execution of the contract agreement between HRM and Thermo Dynamics Ltd. (*February 15, 2013*);
- Creation of Solar City project office and the hiring of 2 term staff members on 18 month contracts; (*February 15 & March 11, 2013*);
- Finalization of screening and feasibility assessment processes (*March 4, 2013*);
- Finalization of customer agreements (*March 4, 2013*);
- Completion of Temporary Borrowing Resolution with Municipal Finance Corporation (*March 21, 2013*); and
- Completion of an additional \$100,000 funding agreement with Nova Scotia Department of Energy to support monitoring systems implementation (*March 31, 2013*).

Almost all the key administrative processes and milestones have been completed during the ramp up phase. The execution of the Federation of Canadian Municipalities Green Municipal Fund agreement for a \$5.455M low interest loan and the \$545,000 grant, are the only significant administrative milestone still to be completed. This is expected to be complete by September 2013.

The Nova Scotia Department of Energy (NSDE) was interested in seeing more homeowners adopt monitoring systems, not only for their benefit but to validate the performance and effectiveness of solar on a broader scale. With this goal in mind, the NSDE contributed an additional \$100,000 to the Solar City Pilot Project. The contribution has been used to support the redesign of the monitoring system by TDL, to reduce the cost and increase the usability of the system for homeowners. Cost reductions are also being gained by installing all monitoring sensors and programming in the factory (versus current field installation practice), moving the manufacturing of the monitoring system from the US to Canada, and increasing the scale of the deployment from 150-300 systems to over 500 systems.

The overall program is currently on track and within budget forecasts.

#### **Public Communication Milestones:**

With over 1,600 participants registered in the pilot, a key element of the success of the Solar City Program will be how well information is shared with the public, how well public expectations are managed (especially during the initial ramp up phase), and how well issues are addressed. A high degree of emphasis on communication and engagement has been placed during the roll out of the pilot program.

A variety of tools have been used to effectively communicate with the public and stakeholders including through open houses, e-mail ([solarcity@halifax.ca](mailto:solarcity@halifax.ca)), the website ([www.halifax.ca/solarcity](http://www.halifax.ca/solarcity)), solar city office telephone (902-240-8208), and information bulletins. Some of the communication highlights in the last three months include:

- Hosted 4 Open Houses for registered participants with over 400+ people in attendance (Canada Games Centre – *January 24*, Cole Harbour Place – *January 31*, BMO Centre – *March 6*, Saint Mary’s Basilica – *March 13*). Two more open houses are scheduled in the near future on May 14 at 6 p.m. at Saint Margret’s Centre, Tantallon, and on July 17 at 6 p.m. at the Sackville Heights Community Centre.
- Over 1,000 e-mail responses to residents who are either registered in the program or who have expressed interest in the program.
- Distribution of three information bulletins to residents (*January 10, February 13, and April 20, 2013*).
- Solar City website to communicate to residents (ongoing revisions, *January 15, 2013*) [www.halifax.ca/solarcity](http://www.halifax.ca/solarcity) .
- Development of a stream lined assessment and screening report that provides a high quality feasibility assessment to the homeowner prior to making a decision if they want to have a system installed. A sample copy of the free assessment homeowners receive is attached.
- Development of an education strategy about the complimentary link between water consumption and the link to solar hot. (This was also part of FCM GMF funding requirement.) A piece of literature explaining the link was also produced by staff and is distributed to homeowners during the site visit by TDL, where water conservation efforts are undertaken.

### **Program Deployment Milestones:**

There are a variety of metrics to gauge the level of interest and deployment of solar through the Solar City program. Generally, the level of activity is ramping up almost exactly as predicted. With March being the first full month of assessments and installations by Thermo Dynamics Limited, it is important to note that there is minimally a 4-6 week lag between when a site visit to a home is conducted, Thermo Dynamics produces a customized report, a homeowner signs back an agreement, a permit is applied for, and a system installed.

In the very initial six week period from **March 1-April 15, 2013**, the following deployment milestones were achieved:

- Over 90 homes had site assessments completed;
- Over 80 customized feasibility reports were sent out to homeowners;
- 12 homeowners were screened out of the program due to poor economics or structural issues;
- 17 homeowners have signed agreements;
- First 7 installations were completed (5 in March, with 15 expected in April);
- 80% of homeowners have adopted an optional monitoring system;
- 20% of homeowners have elected to participate in the program, without financing (i.e. paying for it themselves upfront); and
- The average Return On Investment (ROI) for homeowners is 7-9%.

To date, staff has been able to effectively manage the contractual paperwork between the homeowner, Thermo Dynamics and HRM. Of note, the HRM Permitting Departments efforts to streamline the permitting process for solar hot water last fall, has now proven to be extremely useful, with most permits being issued within four days after the application filed by Thermo Dynamics Limited. Other solar contractors are also seeing the benefit of this streamlined permitting process.

### **FINANCIAL IMPLICATIONS**

There are no impacts to the 2013/2014 Operating or Project Budgets from this report.

### **COMMUNITY ENGAGEMENT**

There has been extensive community engagement as discussed in the Discussion Section of this report.

### **ATTACHMENTS**

Attachment: Sample Solar City Feasibility Report

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A copy of this report can be obtained online at <http://www.halifax.ca/commcoun/cc.html> then choose the appropriate Community Council and meeting date, or by contacting the Office of the Municipal Clerk at 490-4210, or Fax 490-4208.

Report Prepared by: Julian Boyle, P.Eng, Energy Manager, Planning and Infrastructure, 476-8075  
Original Signed

Report Approved by: Richard MacLellan, Manager, Energy and Environment Office, 490-6056

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## 1. SITE ASSESSMENT

### Solar Collectors:

|   |                                     |
|---|-------------------------------------|
| <b>Number of Collectors:</b>                    | 2                                   |
| <b>Collector orientation from due south:</b>    | 48°<br>(Optimum is 0° or due south) |
| <b>Slope of collectors on the roof segment:</b> | 26.5°                               |



Figure 1: Approximate location of collectors and exterior piping (not to scale)

### Homeowner's Information:

| No. of Residents | Domestic Water Heating Fuel | Water Consumption (m <sup>3</sup> /yr) | Home Electrical Consumption (kWh/year) | Home Heating Fuel | Home Fuel Consumption (L/year) | Total Energy Consumption (kWh/year) |
|------------------|-----------------------------|--|--|-------------------|--------------------------------|-------------------------------------|
| 3.5              | Electricity                 | 294                                    | 8,459                                  | Oil               | 3,598                          | 46,748                              |

## 2. ENERGY, FUEL COST AND GREENHOUSE GAS SAVINGS (CALCULATED)

| Current Energy Consumed by Domestic Hot Water System (MWh/year) | Solar Fraction (hot water needs met by solar energy) | Estimated Annual Fuel Savings (MWh of Electricity) | Estimated Annual Cost Savings | Estimated Greenhouse Gas Reduction (kg CO <sub>2</sub> e/year) |
|---|--|--|-------------------------------|--|
| 4.8   | 62%  | 2.9  | \$454                         | 2,129  |

### Estimated Return on Investment: 8.6%

Savings estimates are based on the following assumptions: initial energy price is \$0.154 per kWh of Electricity; 60 litres/day/person baseline hot water consumption; hot water supply of 55°C (131°F). Return on investment estimate is based on 5% per year energy cost escalation over 25 years, and a lump sum payment of \$7,796.35 (includes all rebates and taxes).

Calculations are based on best available information at the time of screening. The Halifax Regional Municipality or Thermo Dynamics makes no warranty or guarantee of actual energy savings.

### 3. SCREENING NOTES AND EQUIPMENT SPECIFICATIONS

**Notes** - Solar collectors are to be flush mounted on the front roof as shown in the above figure. It is recommended the homeowner replace the shingles prior to installation. An inside line-run may be possible using an existing HVAC chaseway. Homeowner is to clear an area for the solar tank as discussed prior to installation date. Additional material and labour included to provide homeowner with valves to switch between oil and electric hot water heating.

If optional monitoring system is chosen, homeowner is to provide an AC power outlet within 1.2 m (4') of the solar storage tank, as well as internet service. Homeowner is to identify preference for optional monitoring system and/or optional new electric hot water tank in Customer Agreement.

**Equipment** - Thermo Dynamics Ltd SB64-9PVT Solar Boiler™ package, including but not limited to:

- 2 Thermo Dynamics flat plate solar collector (dimensions: 2.4 m x 2.4 m or 8' x 8');
- CSA-certified solar water heater, the Solar Boiler™;
- Mounting hardware for the solar collector(s);
- Solar Boiler™ module, including Solar Pump™, controller, heat exchanger, expansion tank, glycol reservoir, glycol, pressure relief valve, pressure gauge, air separator, drain/fill assembly, insulation, temperature sensor, plastic enclosure, unions for connect/disconnect to/from the solar storage tank;
- 279-litre solar tank, CSA listed, glass-lined and insulated, and factory pre-plumbed; and
- 4 litres of glycol to top up system as required.

### 4. QUESTIONS?

More details and information on calculations, assumptions and equipment specifications are available at [www.halifax.ca/solarcity](http://www.halifax.ca/solarcity)

You may also contact the Solar City Program office at (902) 240-8204 or [solarcity@halifax.ca](mailto:solarcity@halifax.ca) if you have any questions.