

Item No. 11.2.1
Halifax Regional Council
November 2, 2010

TO: Mayor Kelly and ~~Members of Halifax Regional Council~~

SUBMITTED BY: Original signed
Councillor Barry Dalrymple, Acting Chair
Energy and Underground Services Advisory Committee

DATE: October 18, 2010

SUBJECT: Community Solar Project

ORIGIN

Energy and Underground Services Advisory Committee meeting of October 15, 2010.

RECOMMENDATION

It is recommended that Halifax Regional Council

1. Continue to explore the potential financial, administrative, environmental and local economic impacts of a community solar project, and update Council as required.
2. Hold public engagement sessions to gauge residents feedback on the uptake of a voluntary pilot program for solar hot water installations.
3. Request the Province of Nova Scotia amend the HRM Charter to enable security of financing of energy conservation or environmental improvement of a property via lien authority.

BACKGROUND

At the October 15, 2010 Energy and Underground Services Advisory Committee meeting, staff provided a presentation on a potential community solar project in regard to a voluntary pilot program for solar hot water installations.

DISCUSSION

The Committee endorsed the concept and approved the staff recommendation to forward this matter to Regional Council for consideration.

BUDGET IMPLICATIONS

None associated with this report. The attached staff report budget implications.

FINANCIAL MANAGEMENT POLICIES/BUSINESS PLAN

This report complies with the Municipality's Multi-Year Financial Strategy, the approved Operating, Project and Reserve budgets, policies and procedures regarding withdrawals from the utilization of Project and Operating reserves, as well as any relevant legislation.

COMMUNITY ENGAGEMENT

Not applicable with this report. The attached staff report addresses community engagement.

ALTERNATIVES

The Committee did not provide any alternatives.

ATTACHMENTS

Attachment 'A': Staff report dated September 28, 2010.

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

Report Prepared by: Sheilagh Edmonds, Legislative Assistant.



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**Energy and Underground Services Committee
October 15, 2010**

TO: Chair and Members of Energy and Underground Services Committee

Original signed

SUBMITTED BY: _____
Phillip Townsend, Director, Infrastructure and Asset Management

DATE: September 28, 2010

SUBJECT: Community Solar Project

ORIGIN

This report originates from Staff. Additionally, this effort is linked to:

- Community Energy Functional Plan
- GreenHouse Gas Emissions Reduction Functional Plan

RECOMMENDATION

It is recommended that the Energy and Underground Services Committee recommend to Regional Council that staff:

1. Continue to explore the potential financial, administrative, environmental and local economic impacts of a community solar project, and update Council as required.
2. Hold public engagement sessions to gauge residents feedback on the uptake of a voluntary pilot program for solar hot water installations.
3. Request the Province of Nova Scotia amend the HRM Charter to enable security of financing of energy conservation or environmental improvement of a property via lien authority.

BACKGROUND

Halifax Regional Municipality (HRM) has continued to be progressive in examining and delivering corporate and community energy opportunities. The examples range from energy efficiency initiatives, financing, innovative contract delivery, geothermal implementation, regulatory expertise and incubating community District Energy project concepts. With this progress corporately, Staff have developed a substantial amount of working knowledge and capacity in the delivery of Energy Projects and are applying lessons learned corporately to community initiatives.

This work is related to the Community Outcome Area: Clean and Healthy Environment, and reflected in the Regional Plan in the Greenhouse Gas Emissions Reduction Functional Plan, the Community Energy Functional Plan and impacts Economic Development. This initiative has alignment with HRM Community Outcome Areas and Regional Plan Policy. As well, in Table 19 of the 2010 Citizen Survey, providing Energy Incentive programs was identified as an opportunity for HRM for improvement.

HRM Community Outcome Area: Clean and Healthy Environment

“A community that values and protects its resources and reduces its ecological footprint for present and future generations through strategies that promote clean air, land and water, and reduced use of carbon fuel.”

Policy E-22 (Regional Plan): HRM shall prepare an Emissions Reduction Functional Plan which shall identify programs and methods to reduce the level of air pollutants and greenhouse gases.

Policy SU-22 (Regional Plan): HRM shall prepare a Community Energy Functional Plan to identify clean, efficient and renewable supplies of energy and to reduce consumption. Consideration shall be given to implementing the recommendations through HRM’s operational and administrative programs and land use policies and regulations.

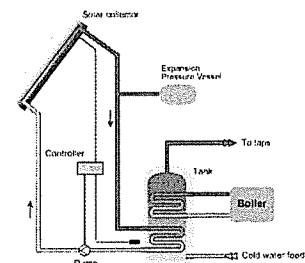
At a previous EUGS committee meeting, staff arranged for a presentation related to solar potential in HRM. The clear message is that the potential is substantial, however, it is under utilized and not being applied in a large scale in HRM. Solar hot water installations are typically very labour intensive as compared to other renewable energy technologies.

Types of Solar Energy Projects

Essentially, there are three types of solar energy projects available to homeowners: Solar Hot Water, Solar Hot Air, and Solar Photovoltaic.

Solar Hot Water

Solar Hot water projects supplement a homes heating requirements by supplementing normal hot water boilers or hot water tanks by pre-heating the water. This technology can provide substantial reduction in the electricity or fuel needs to heat water for a home heating system. The schematic is shown below. These installations are installed via plumbing into the water pipes of a home. Installs cost between \$4,000 and \$5,000



per panel, typically.

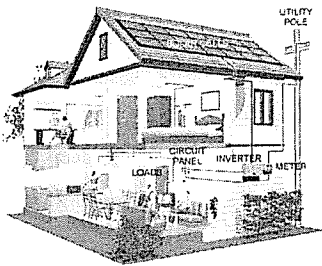
Solar Thermal

By installing a solar panel on the south facing wall of a home, a solar thermal (hot air) panel can provide heat during day time to a home and supplement the furnace requirements. These are installed by a fan that intakes and outlets air from the home. These panels can be installed often for under \$2,000 per panel.



Solar Photovoltaic

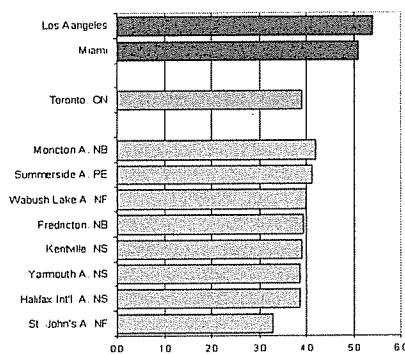
Solar photovoltaic systems create electricity. In Ontario, homeowners are able to create enough electricity to supply their own needs and sell some back to the electricity grid. Solar PV systems are quite costly, and currently NS homeowners cannot sell electricity back to NS Power.



The project contemplates usage of Solar Hot Water which is a very mature technology.

Solar Potential in Nova Scotia

On an annual average, Nova Scotia receives about 3.5 to 4 hours of bright overhead sunshine per day (this average takes into account winter, summer, cloudy days, etc.), which equates to approximately 1300 to 1500 kilowatt-hours (kWh) per square metre of available solar energy on an annual basis.



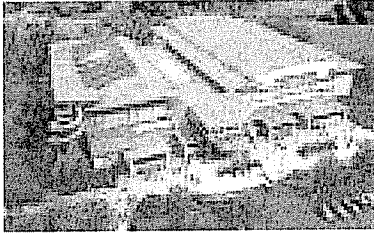
Multiplying this number of kilowatt-hours by the collector efficiency (typically 0.5 for a solar water heater and 0.15 for solar photovoltaic panels) and the collector area, will give you a rough estimate of the amount of energy you can collect. For example, by this calculation a 4 foot by 8 foot solar water heater will collect approximately 2100 kWh of energy per year.

Studies have found that Nova Scotia's mild climate, but cold clear winter days, combine to give its capital city, Halifax, the third best solar climate in Canada. Hundreds of passive solar houses have been built over the past few decades in the province, and the largest solar panel manufacturer in Canada is located in Nova Scotia.

We have plenty of opportunity to adopt solar heating alternatives.

DISCUSSION

HRM has recently encouraged the use of solar hot water on several large scale installations, including the new Canada Games Centre, Halifax Police Station, and Centennial Pool. There are several lessons learned from the actual implementation of these projects that help explain the under utilization of solar hot water in the community.



Some of these lessons are:

1. Complexity of technology options. There are many types of solar energy technologies available, choosing the appropriate technology for the applications requires unbiased technical expertise.
2. Complexity/difficulty in financing. Like most renewable energy technologies there is a long term payback that ranges from 10-15 years. For most consumers this is a significant challenge - finding the up front capital to fund a long term payback. To add to this complexity there are currently a multiplicity of grant/loan programs available to the consumer (Federal, Provincial, NSPI, etc.) that require very sophisticated knowledge of eligibility criteria, timing of funding, expiration of funding, etc. Adding to this confusion all of these programs change on yearly cycles.
3. Solar industry is relatively small and fragmented. There is not a lot of capacity on the design, installation and operating of solar technologies. HRM is adopting many best practices in implementing solar energy, however, these are currently a challenge to the industry to provide.

Consumers without the construction experience and technical expertise like HRM are probably finding it extremely difficult to make choices and implement even small scale solar projects cost effectively.

In a desire to build community capacity and economic opportunity around alternative energy projects, build upon the corporate experiences of HRM, and help reduce the community Greenhouse Gas Inventory, staff have been investigating a potential Community Solar Project.

The brief summary of the Project is as follows:

1. HRM would act as a financial administrator and contracting agent.
2. The scope of the pilot project would be to initially install 1000-1500 solar panels on 500-700 homes in HRM (2 panels per qualified household) within 1 year.
3. The anticipated source of the financing would be the FCM Green Municipal Fund.

4. The financing/payment scheme would enable residents to pay back their installation from the cost savings of their energy bills (conceptually a \$400 decrease in energy bill and a \$400 increase as a supplement to their tax bill). At the end of the financing period (depending on available rebates, between 5 and 10 years), the homeowner would have paid off the installation and enjoy the energy savings in full.
5. The project would be developed to bring in revenues that would exceed costs to create a sustainable financial model. This would be done by recapturing the lower interest rate savings of the FCM GMF and keeping the grants available with an FCM GMF loan. It is important the business model be financially sustainable to enable the program to scale up.
6. The value of the pilot project is approximately \$5 million. If successful the possibility is to scale this up to over \$50 million per year.
7. A preliminary assessment suggests that there is a very strong economic development incentive within the project. At full scale there is the potential to create significant capacity with over 300 jobs and over \$3 million in energy savings being achieved in the local economy.
8. Best practices and education on solar potential and utilization would be built into the project, including providing the right incentives within the context of new developments and the Regional Plan.

There are a number of challenges, these include - but are not limited to:

- Legislative ability within the MGA
- Community uptake
- Liability
- Financing
- Implementation

To date, Staff from the Sustainable Environment Management Office have reviewed the concept for viability with Economic Development staff, the CAO's office, Permit and Inspections Staff, Finance, Legal Services, and with Conserve NS. As we continue to discuss the concept, there appears to be momentum and a desire to incubate this idea. A recommended next step is to do some public consultation to verify public uptake. This would be performed jointly with Conserve Nova Scotia. That public feedback will enable some stronger modelling of the possibility of preparing an application and business plan for a Community Solar Energy Project.

BUDGET IMPLICATIONS

There are no budget implications of staff continuing to investigate the viability of a community solar energy project. The cost of conducting public consultation to assess interest will be captured within SEMO operating budget D935.

FINANCIAL MANAGEMENT POLICIES / BUSINESS PLAN

This report complies with the Municipality's Multi-Year Financial Strategy, the approved Operating, Project and Reserve budgets, policies and procedures regarding withdrawals from the utilization of Project and Operating reserves, as well as any relevant legislation.

COMMUNITY ENGAGEMENT

It is intended to conduct some community consultation to investigate the uptake in a Community Solar Energy Project as the next step in this concept review.

ALTERNATIVES

None

ATTACHMENTS

Presentation to be provided

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 : Richard MacLellan, Manager, Sustainable Environment Management Office, 490-6056
 Julian Boyle, P.Eng., Energy Auditor, Facility Development, 476-8075