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Item No. 15.1
Environment and Sustainability Standing Committee
December 5, 2019
Audit and Finance Committee
January 2020

TO: Chair and Members of Environment and Sustainability Standing Committee

-ORIGINAL SIGNED-

SUBMITTED BY:

Kelly Denty, Director, Planning and Development

-ORIGINAL SIGNED-

Jacques Dubé, Chief Administrative Officer

DATE: October 28, 2019

SUBJECT: **2019 Solar City Program Update**

ORIGIN

December 04, 2018 Regional Council passed the following motion:

MOVED by Deputy Mayor Mancini, seconded by Councillor Whitman that Halifax Regional Council:

1. Approve the continuation of the Solar City Program as a clean energy, community-based program; and,
2. Direct staff to provide annual reports on the Solar City Program to the Environment and Sustainability Standing Committee.

LEGISLATIVE AUTHORITY

Clause79(1)(ada) "...Council may expend money required by the Municipality for...(ada) providing for, financing and installing energy-efficiency equipment on private property including, without restricting the generality of the foregoing, solar panels.

Clause104A(1)(a) "...Council may make by-laws imposing, fixing and providing methods of enforcing payment of charges for the for the financing and installation of any of the following on private property with the consent of the property owner...(a) equipment installed pursuant to an expenditure under clause 79(1)(ada);

By-Law Number S-500 Respecting Charges for Energy Equipment

RECOMMENDATION

Environment & Sustainability Standing Committee:

It is recommended that the Environment & Sustainability Standing Committee accept the annual report for the Solar City Program and forward the report to Audit and Finance Standing Committee to approve the budget recommendation.

Audit and Finance Standing Committee:

It is recommended that the Audit and Finance Standing Committee recommend that Halifax Regional Council approve an increase to the gross budget for capital account CD990005 – Solar City Program by \$9,000,000, with repayment received from Solar City Participants for no net impact to the overall budget.

BACKGROUND

The Solar City Program is offered to eligible property owners, which include residential, not for profits, places of worship and cooperatives. The program offers property owners access to innovative solar energy options, which can be financed through the Halifax Regional Municipality. The solar energy options include solar electric (photovoltaic), solar hot air; and/or solar hot water.

With guidance from the Solar City administrator, property owners select their preferred solar energy system and solar contractor. The Solar City administrator provides a level of review and due diligence to help ensure that installed solar energy systems meet industry standards and will provide energy and cost savings over the lifetime of the system.

Financing is applied to the property and not the individual, similar to a standard Local Improvement Charge (LIC). There are no credit checks required to confirm eligibility; however, property owners must be in good financial standing with respect to property taxes, LICs, and any other relevant municipal charges. Financing is repaid separately from the annual property tax bill at a fixed interest rate of 4.75% over ten years. Property owners have the option to pay in full at any time without penalty. If a participant sells their property before full repayment, they have the option to pay in full at the point of sale or pass the charge to the next property owner.

DISCUSSION

Measuring Program Performance

Since the program launched in May of 2016, just over 2,500 property owners across the Municipality have shown interest in solar energy by registering their property for consideration. At the point of registration, property owners are informed of the solar technologies eligible for financing and educated on current market trends, and potential system costs and savings before reaching out to solar contractors for a formal quotation. As summarized in Table 1, 420 Solar City Participant Agreements have been executed to date, totalling \$10.3 million in financing committed to the installation of solar energy technologies. These systems are expected to save property owners a total of \$700,000 each year in utility costs and reduce annual greenhouse emissions in the community by approximately 3,000 tonnes.

Table 1: Summary of overall Solar City Program statistics.

Key Performance Indicators	2016/17	2018	2019	Total
Installed capacity (MW)	0.31	1.40	1.90	3.61
Energy generated per year (eMWh)	350	1,650	2,280	4,280

GHG emissions offset per year (tonnes eCO ₂)	250	1,200	1,600	3,050
First year utility savings	\$55,000	\$265,000	\$379,000	\$699,000
System costs (HST incl.)	\$989,000	\$3,965,000	\$5,346,000	\$10,300,000
Executed Solar City Participant Agreements	65	161	194	420

Tables 2 and 3 summarize individual technology metrics as tracked through the Solar City Program. To date there has been only one solar hot air system installed through the Solar City Program. This does not provide enough information to accurately gauge average system expectations. As shown in Table 2, 38 solar hot water system agreements have been executed through the program. 37 of these systems use flat plate technology while the other uses evacuated tube technology. All flat plate systems were designed to pre-heat domestic hot water, while the single evacuated tube system was installed as a hybrid, preheating both domestic hot water and space heat. Both electricity and furnace oil consumption will be offset by these systems. Solar hot water systems installed under the program are expected to save property owners an average of \$387 on their utility bills in the first year of operation. With the expected escalation of fuel costs and inflation, the average property owner can expect to see a system payback of 16.7 years and will save approximately \$19,800 over the 25-year analysis period. The 25-year ROI and IRR is estimated to be 123% and 5.04% respectively. No solar hot water systems have been requested for financing in 2019.

Table 2: Summary of solar hot water statistics through the Solar City Program.

Key Performance Indicators	Average	Total
Executed Solar City Participant Agreements	-	38
Energy avoided per year (ekWh)	2,533	96,264
GHG emissions avoided per year (tonnes eCO ₂)	1.57	59.60
System Costs	\$8,875	\$337,231

As shown in Table 3, there have been 381 solar electric system agreements executed through the program. All but one system is connected to Nova Scotia Power Inc.'s (NSPI) transmission and distribution grid, making use of their Enhanced Net Metering Program. Solar electric systems installed under the program are expected to save property owners an average of \$1,800 on their utility bills in the first year of operation. With the expected escalation of fuel costs and inflation, the average property owner can expect to see a system payback of 13.8 years (9.9 with the SolarHomes Rebate) and save a total of \$70,600 over the 25-year analysis period. The 25-year ROI and IRR is estimated to be 169% and 6.43% respectively. The average levelized cost of energy¹ (LCOE) for these solar electric systems is 17.00 cents per kilowatt hour (¢/kWh), just over half a cent more than the current residential rate. This LCOE is locked in for the lifetime of the system independent of increasing energy costs.

Table 3: Summary of solar electric statistics through the Solar City Program.²

Key Performance Indicators	Average	Total
Executed Solar City Participant Agreements	-	381
Energy avoided per year (MWh)	11	4,183
GHG emissions avoided per year (tonnes eCO ₂)	7.85	2,992
System Costs	\$26,133	\$9,956,800

Property owners from across the Municipality have been participating in the Solar City Program as shown in Figure 1, which compares the number of systems financed through the Solar City Program to the overall

¹Levelized cost is the average expected unit-cost over the 25-year system lifespan.

²Statistics do not include the SolarHomes Rebate.

number of systems installed, broken down by municipal electoral district. The total number of systems installed was informed by the number of solar permits obtained. On average, 67% of all systems installed within the municipality have been financed through the Solar City Program. While some property owners opt to use alternative financing, the program is open to anyone looking for unbiased advice and education on the various solar technologies, industry trends and average pricing.

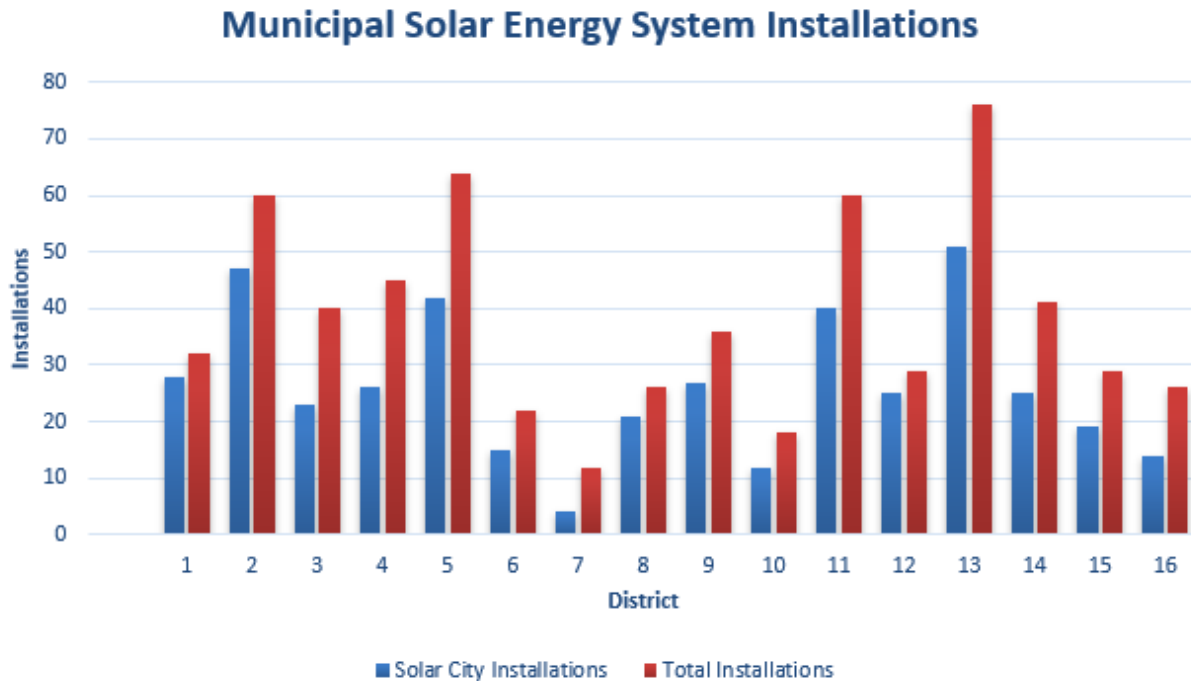


Figure 1: Total installations by municipal electoral district

While the Solar City Program offers complete financing to all feasible solar technologies, there has been a clear shift towards solar electricity. Of the committed financing, 97% has been allocated to the install of solar electric. This has been the only technology financed to date in 2019. Aside from innovative financing options like the Solar City Program, this shift can be largely attributed to the reduction in systems costs, increased market competition, the Enhanced Net Metering Program and the SolarHomes Rebate Program.

Industry Impacts

The Solar City Program continues to have a positive impact on the solar industry in Nova Scotia. By encouraging property owners to contact several solar contractors and evaluate each based on price, experience and quality, the value being offered has remained high while costs through the Solar City Program have steadily declined as shown in Figure 2.

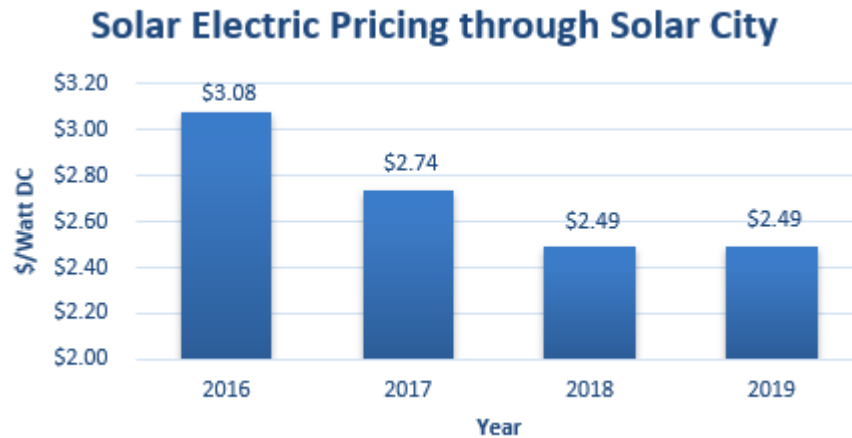


Figure 2: Installed unit cost (before HST) for solar electric systems approved through the program. Average pricing has declined from roughly \$3.08/Watt (DC) in 2016 to \$2.49/Watt (DC) in 2019.

At this time, the introduction of a rebate looks to have leveled out the average pricing. This will continue to be tracked as the rebate changes.

The Solar City Program has contributed to the growth of a competitive solar industry which will be critical for reducing community emissions. In 2016, five solar contractors from across the province were participating in the Solar City Program. Today, there are 24. The contractors who are actively participating have realized the value provided by the Solar City Program as it is a key point of contact for unbiased advice and education. This has greatly assisted solar contractors with the cost of acquisition as it allows them to streamline the quoting process and provide timely responses to interested property owners. While 24 solar contractors have participated in the program over the past three years, four have been very active, collectively installing just over 75% of all systems to date.

Nova Scotia Power Enhanced Net Metering Program

The Solar City Program has had a positive contribution to NSPI's Enhanced Net Metering Program. The Net Metering Program credits property owners for solar electricity produced but not consumed at the property. This rate credited is equal to the rate paid by the property owner for electricity and will continue to be equal as utility rates increase each year. In January 2019, NSPI released their annual Net Metering report. The report indicated that there was 903 kW of residential solar electric capacity installed in HRM during 2018. During this same timeframe, 751 kW of solar electric capacity was commissioned under the Solar City Program, representing 83% of all solar electric capacity installed in the municipality. It is anticipated that the Solar City Program will continue to positively impact the Enhanced Net Metering Program. Since the Program began in 2016, 3.5 MW of solar electric capacity has been approved for financing, of which 1.9 MW has been approved so far this year.

SolarHomes Rebate

In August of 2018, the SolarHomes rebate program was launched to assist residential property owners install solar electric systems at their property. The rebate is funded federally through the Low Carbon Economy Fund and is being administered by Efficiency Nova Scotia. At the program launch, the rebate was valued at \$1/Watt (DC) installed up to a maximum of \$10,000 or 40% of the overall system cost before taxes. As of November 1st, 2019, the rebate is \$0.60/Watt (DC) installed up to a maximum of \$6,000 or 25% of the overall system cost before taxes. The SolarHomes rebate program has been very popular amongst Nova Scotians so a gradual rebate reduction over time is necessary to ensure the rebate is far reaching and provides stability to the industry.

To date it is estimated that participants of the Solar City Program will receive \$2.6 million in total SolarHomes rebates, an average of 31% of the overall systems costs (HST included). This rebate has alleviated much of the concerns for property owners regarding high system costs and payback periods. Combining the provincial rebate with the Municipality's financing has resulted in an average expected system payback period of 9.9 years.

Rationale for Budget Increase

To date, \$10,299,713 of the \$13,112,700 Solar City budget has been committed to financing solar energy systems. Table 5 summarizes the monthly financing amount that has been approved for 2019 to date.

Table 4: Monthly approved financing - 2019

Month	Total Financing Amount
January	\$306,728
February	\$361,824
March	\$474,380
April	\$821,309
May	\$569,031
June	\$649,802
July	\$561,776
August	\$564,545
September	\$410,713
October	\$625,990
Monthly Average	\$534,610

On average, just over \$500,000 in solar energy projects is being financed per month, which is expected to remain consistent through 2020. At this rate, the remaining Solar City budget will expire by the end of April 2020, around the same time that HalifACT 2050 is targeted for Regional Council's consideration. Pending direction from Council, time will be needed to plan and implement new or revised programs to meet our climate objectives, therefore a budget increase is needed to continue the successful delivery of the Solar City Program. It is recommended that Regional Council increase the budget for project account CD990005 Solar City Program by \$9,000,000 (18 months) so the project can continue. All re-payments are placed back into the account to cover the program costs.

SUMMARY

The Solar City Program continues to have a positive impact on the community by helping to alleviate the upfront cost of solar energy systems and helping stimulate the solar industry. The program is also advancing the Municipality's climate change mitigation efforts as outlined in its existing Community Energy Plan (CEP), a Priority Plan that is being updated as part of HalifACT 2050. The Solar City Program is contributing to increased energy security and a more diverse energy supply, it is promoting education and awareness of solar energy, and is demonstrating local leadership in renewable energy, all goals of the existing CEP.

While the program is successful, work done for the development of HalifACT 2050 shows that on-site renewable energy generation within the municipality needs to be scaled up significantly over the next ten years alongside deep energy retrofits. Staff are working to reimagine the Solar City program to determine if it can further incentivize property owners to retrofit in addition to installing renewable energy. It may be that a new program is proposed in addition to Solar City, or that Solar City is expanded to go beyond solar

technologies. Any new program will be analyzed through a lens of social equity to explore ways in which to make the program more accessible to all property owners across the municipality.

FINANCIAL IMPLICATIONS

The Solar City program is designed to cover all costs associated with borrowing, administration and marketing through the program's fixed interest rate of 4.75%. With current financial assumptions and forecasted program participation levels, all costs will be recovered once full repayment of all systems financed is complete. As program participation levels and interest rates change, the program will be regularly monitored to ensure interest revenue collected is adequate to cover direct administration, marketing and the cost of borrowing.

Budget Summary - CD990005 – Solar City Program

Cumulative Unspent Balance	\$ 2,812,987
Add: Budget Increase	\$ <u>9,000,000</u>
Revised Balance	\$11,812,987

Budget availability has been confirmed by Finance.

RISK CONSIDERATION

The Solar City program is expected to see changes in participation as provincial rebates and other funding availability changes. Staff will monitor the demand as the program continues.

There is a possibility that at some point in the future, the Solar City program will achieve market saturation. Staff will be prepared to adjust or sunset the program at that time.

Many assumptions are made when determining the appropriate interest rate for Solar City. Program participation, interest rates and early payments are among the factors that can vary over time, and they are factors the Municipality has little control over. Based on current assumptions, the break-even rate could fall between 3.68% and 5.53%. The current rate of 4.75% falls within that range. Staff will monitor actual program outcomes and adjust the rates in the future as needed.

COMMUNITY ENGAGEMENT

Community engagement was not formally conducted as part of this report. Engagement with the community has been ongoing through the Solar City Program as inquiries have been received by email or phone and through marketing efforts and participant surveys

ENVIRONMENTAL IMPLICATIONS

The Solar City Program provides environmental benefit by offsetting greenhouse gas emissions through the use of renewable energy technology, as articulated in the Discussion section of this report.

ALTERNATIVES

The Environment and Sustainability Standing Committee may decide not to forward the report to Audit and Finance Standing Committee to approve the budget recommendation and instead recommend that Regional Council discontinue the Solar City Program once the \$13,112,700 budget of project account CD990005 has been exhausted.

This is not recommended as the program is currently achieving its objectives of increasing the use of solar energy in the municipality, educating and supporting residents interested in solar energy, and working towards decreasing community-wide greenhouse gas emissions and improving energy security. Providing financing eliminates the upfront cost barrier to participants who cannot pay or finance the entire system costs. Ending the Solar City Program would result in less solar energy systems throughout the community, and risk losing industry capacity and expertise needed for the success of HalifACT 2050.

ATTACHMENTS

None

A copy of this report can be obtained online at halifax.ca or by contacting the Office of the Municipal Clerk at 902.490.4210.

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