
Facilitating Solar Energy Opportunities in Saskatoon

Recommendation

That the report of the Acting General Manager, Corporate Performance Department, dated November 6, 2017, be forwarded to City Council

Topic and Purpose

The purpose of this report is to outline potential roles for the City of Saskatoon (City) in facilitating solar energy opportunities within city limits.

Report Highlights

1. Solar Energy has become an emerging opportunity in the world and Saskatoon has the potential to capitalize on this opportunity.
2. To facilitate Solar Energy uptake, there is a potential role for the City to develop programs and implement changes to existing City policies to address current market barriers. Changes to Provincial Acts would also help facilitate the development of solar energy at the local level.

Strategic Goals

The recommendations contained in this report directly contributes to the Performance Target to reduce greenhouse gas emissions and also align with several four-year priorities and long term strategies under the Strategic Goal of Environmental Leadership.

Background

City Council, at its meeting held on January 25, 2016, considered the Municipal Greenhouse Gas Emissions Reduction Strategy – Response to Saskatchewan Environmental Society Letter report; and resolved, in part:

- “2. That the Administration report on emerging opportunities to facilitate large and small solar energy opportunities in Saskatoon on City or privately-owned land.”

City Council, at its meeting held on May 23, 2017, considered the Energy Performance Contracting Negotiations and Letter of Intent report and resolved in part:

- “2. That the Administration communicate to the Energy Services Company that loan periods greater than 15 years, and potentially as long as 30 years, may be acceptable to City Council.”

The report stated that there is the opportunity to achieve greater GHG savings, install more renewable energy systems (e.g. solar photovoltaic panels), and modernize more aging infrastructure (thus further reducing the burden on the Civic Building Comprehensive Maintenance reserve (CBCM)) by increasing the allowable loan

periods. To maximize the achievement of these goals the Administration recommends that the ESCO be permitted to explore retrofit options that result in loan periods longer than 15 years.

Report

Emerging Opportunities for Solar Energy

A number of factors are currently having an influence on the attractiveness of solar power production as an opportunity. These include the solar resource in Saskatchewan, increasing electrical utility rates, changes in technology and market economics, and growing community interest in solar energy. Attachment 1, Factors Influencing Solar Opportunities, describes these factors in more detail.

The city consumed 1.9 million megawatt-hours (MWh) of electricity in 2014 (year of last greenhouse gas emissions inventory). If electricity consumption were assumed to be constant, approximately 1,600 MW of solar electricity could meet current community annual consumption.

Opportunities on City sites

Administration conducted a preliminary scan of opportunities to develop solar arrays on City-owned properties and determined there may be an opportunity to develop solar projects on civic lands and buildings that could aggregate together to total up to 400 MW. Even if 5% of City-owned vacant land is used for solar electricity, this can add 40 MW. More in depth analysis is required to determine the capability of using City-owned properties for solar installations.

The City also owns a variety of rights-of-way and under-utilized sites that can accommodate small-scale installations. Rights-of-way are estimated to provide between 42 MW (if 5% of sites are developed) and 425 MW (if 50% of sites are used) of solar potential. However, the current practice in the City is to keep these areas clear to minimize safety concerns and a detailed analysis will need to be conducted to ensure all site specific parameters are accounted for at each proposed site. For example if a right-of-way area has potential to accommodate a small scale installation, the road classification, clear zone width, posted speed, side slopes, traffic volume, and road geometry will need to be considered for the specific location to ensure all safety criteria are met. Administration has not yet determined the scale of generating capacity that may come from constructing shelter structures over parking lots and sport field fan areas, or adding panels to sound attenuation walls, transit shelters and future bus rapid transit stations.

Civic buildings could also accommodate small rooftop installations. Approximately 70 City-owned buildings have a combined potential to generate 1.8 MW of solar energy on their rooftops. Some of the facilities that are anticipated to have the lowest repayment periods include the buildings at the Vic Rempel Yards (Parks facilities), Fire Halls, Farmers' Market, and JS Wood and Mayfair Branch Libraries. The potential for installing solar on civic buildings will be included in the energy performance contracting (EPC) project. The energy services company (ESCO) engaged by the City will be instructed to

consider renewable energy technologies (particularly solar photovoltaic panels) and the use of long loan periods in order to achieve the overall goals of the City.

Opportunities on Private Sites

There are approximately 12,000 acres of privately-held vacant sites (large and small). In addition, private, institutional and residential rooftops provide approximately 4,000 acres of space where solar panels could be installed. The table below provides a high level estimate of the solar capacity that may be developed on rooftops in Saskatoon. The table provides three scenarios where 5%, 25%, or 50% of the available space is utilized to accommodate a solar panel system.

Site	Low (5%)	Medium (25%)	High (50%)
	MW		
Private Vacant Land	89	446	891
Private Buildings			
Commercial	8	42	83
Residential	23	114	228
Institutions	1	7	15
Total (MW)	122	609	1,217

Current Barriers to Solar Uptake

The opportunities for developing solar projects are not currently being realized for a variety of reasons. Development of solar energy is still in its early stages in Saskatoon. For this reason, there are a number of barriers that act as a disincentive to the uptake of solar opportunities. These barriers are described in Attachment 2, Solar Update, Barriers and Potential Solutions, and include:

- Upfront capital investment;
- Rate classes and rate blocks;
- Limited solar access;
- Soft costs (Non hardware costs such as permitting, financing, applications, etc.);
- Limited consumer awareness of solar energy; and
- Grid interconnection wait times.

Facilitating Solar Opportunities

Attachment 3, Overview of Municipal Approaches, provides an overview of several approaches the City may take to facilitate solar energy systems within city limits. The municipal tools range from policy and land use planning approaches, direct investment in solar arrays and system infrastructure, and financial and non-financial incentive programs.

Dunsky Energy Consulting conducted an extensive investigation into program options in 2014 for expanding renewable energy in Saskatoon. The study confirmed that based on Saskatoon's excellent conditions for solar electricity generation, and the changing

economics for solar panel systems, a program offered by the City could reasonably be expected to accelerate the installation of solar panel systems and achieve community greenhouse gas reductions.

The study concluded that developing a program based on the Property Assessed Clean Energy (PACE) model would be the most beneficial for the community and provide the lowest risk to the City. Under the PACE model the City would finance the property owner to purchase solar equipment and a special assessment would be added to the owner's property tax bill to repay the City for the system.

In 2016, the Solicitors Office was asked to review the possibility of using the PACE model for a solar program and the following comments were provided:

- *The Cities Act* provides strict limits on the City's ability to finance home owners and businesses. The City can only lend (or guarantee a loan) to a non-profit organization, a controlled corporation or a business improvement district.
- *The Cities Act* currently does not allow a special assessment to be added to an owner's property tax bill to pay for the purchase of solar equipment.

Based on the Solicitors comments, the City currently cannot use the PACE model to develop a solar program for the City without working with the Province to amend *The Cities Act* to change the restrictions listed above. However, the City can take a lighter approach until these changes occur. For example, the City could provide a revolving pool of funds for a program that can be managed by a third-party organization that in turn provides preferred-rate loans for solar projects. This can help reduce the property owner's borrowing costs and encourage lenders to offer long-term financing that matches the equipment life. The third-party would be responsible for the qualification of participating lenders and hold an agreement for repayment with the property owner in a manner similar to the City's Mortgage Flexibilities Support Program.

Public and/or Stakeholder Involvement

Administration and members of City Council have recently participated in consultations on community solar opportunities hosted by SaskPower. The City intends to continue to engage with SaskPower to better understand what role they plan to take as power regulator, power producer, electricity grid (i.e. electricity transmission and distribution) manager and programmer. It is possible that choices made by SaskPower may enable, enhance, diminish or replace efforts undertaken by the City. Administration will make every effort to stay abreast SaskPower decisions and communicate the implications of these choices to inform future decision-making by City Council.

A number of community stakeholders, ranging from the University of Saskatchewan, non-profit cooperatives and organizations as well as local businesses have demonstrated their interest (i.e. through participation in local forums and SaskPower consultations and by writing and meeting with civic staff) in being involved in any future discussions or decisions pertaining to solar energy opportunities in Saskatoon.

Solar opportunities can mitigate greenhouse gas emissions and will therefore be included as a topic of discussion when the Climate Change Mitigation Business Plan engagement process begins.

Policy Implications

Several municipal approaches identified in this report will require changes to provincial legislation. This includes, but is not limited to, amending sections of *The Cities Act* to allow the municipalities to provide loans such as Property Assessed Clean Energy (PACE) programs currently operating in other jurisdictions.

This report also identifies several policy changes that could be considered.

Financial Implications

Should City Council have an interest in proceeding with any of the identified approaches to facilitating solar energy, the financial implications would require further study.

It is currently estimated that Saskatoon Light & Power's (SL&P) revenue is reduced by \$185.25 for every kilowatt installed by a Net Metering residential customer. This has a direct impact on the utility's ability to fund the maintenance of the existing distribution system for all customers and to provide a return on investment (ROI) and grants-in-lieu of taxes (GIL) to the City. With this program doubling in size every two years, the financial impact continues to grow proportionally. The loss of revenue from the existing programs in 2017 is estimated at \$92,625.

While the price offered to customers through the Net Metering program for their excess generated power is the same as what customers pay to buy electricity from the utility (retail price), this price is much higher than the bulk power rate that SL&P can purchase electricity from SaskPower. The difference between the bulk power rate and the residential retail rate allows SL&P to fund the maintenance and operation of the distribution system.

For this reason, any program that facilitates the replacement of energy sold by SL&P has an impact on their ability to generate Operating Income, which subsidizes the mill-rate thru grants-in-lieu and a ROI. For example, SL&P indicates that if residential customers installed 10 MW of solar on their roofs, GIL paid to the City would be reduced by \$253,000 and the utility's revenue would be reduced by \$1.85 M.

If the City were to proceed with facilitating solar electricity, SL&P would need to develop new funding strategies to ensure the health and sustainability of the electrical grid.

Environmental Implications

Solar energy opportunities would replace the current carbon-intensive energy supplied through the existing electrical grid with 'zero-emissions' energy. For each MW of solar added, it is estimated that approximately 15,893 tonnes of carbon dioxide equivalent (CO₂e) greenhouse gas emissions would be reduced over a 25-year term, which is equivalent to removing 134 cars from the road annually.

Other Considerations/Implications

There are no options, communications, Privacy or CPTED implications at this time.

Due Date for Follow-up and/or Project Completion

There is no due date for follow up identified at this time.

Public Notice

Public Notice pursuant to Section 3 of Policy No. C01-021, Public Notice Policy, is not required.

Attachments

1. Factors Influencing Solar Opportunities
2. Solar Uptake Barriers and Potential Solutions
3. Overview of Municipal Approaches

Report Approval

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