

# Dundonald Avenue Solar Farm Project Implementation

## ISSUE

City Council has a target of reducing greenhouse gas (GHG) emissions by 80% below 2014 levels by 2050. The Low Emissions Community (LEC) plan identified the need for implementation of a utility-scale solar power plant by 2023.

A feasibility study was completed to explore development of a utility-scale solar project on a previously reserved parcel of land located along Circle Drive South near Montgomery Place (Parcel M). The City of Saskatoon (City) was also successful in receiving approximately \$2.56 million funding for the implementation of this project.

City Council direction is needed to determine next steps on the project.

## BACKGROUND

In November 2017, City Council reserved Parcel M, a 13-acre undeveloped parcel for the development of a solar power plant. Administration was requested to explore development options for implementation and conduct community engagement.

In August 2019, City Council received information on the LEC plan which outlined various initiatives including implementation of a utility-scale solar power plant within city boundaries to help achieve desired GHG reduction targets of 80% by 2050. LEC Action No. 30 calls for the implementation of a 1-Megawatt (MW) utility-scale solar system on municipal land, and LEC Action No. 34 calls for the implementation of an additional 20 MW of utility-scale solar by 2030.

In November 2019, City Council reserved \$0.5 million for the implementation of a utility-scale solar farm on Parcel M (Project 1955 – Utility Solar Scale Energy Implementation).

In February 2020, City Council received information on the Green Infrastructure Strategy (GIS), which outlined 15 actions that the City and community can take to reach an interconnected Green Network that provides sustainable habitat for people and nature. Actions related to naturalizing green space include:

- 12.1 - Naturalize parks, storm water infrastructure, and other open space where appropriate.
- 12.3 - Increase the City's use of native species in restoration and naturalization work.

In April 2020, Administration hired the services of an engineering consulting firm to complete a full feasibility study. A portion of the northern part of Parcel M was reserved for future roadways around Montgomery Place. Adjacent vacant land south of Parcel M, which is leftover land from the Circle Drive South project, was included for a revised total of 14 acres for solar implementation.

In April 2021, the City was successful in receiving \$2.56 million of funding from Canada and Saskatchewan governments through the Investing in Canadian Infrastructure Program (ICIP) for this project.

### **Current Status**

A feasibility study has been completed and concluded that the project is technically feasible, meets financial expectations, and is environmentally and socially sustainable.

Key outcomes from the feasibility study are as follows:

- The site is marginal land that has limited access and development opportunities;
- The site can accommodate up to 2.2 MW of solar power, with a lifespan of 30 years;
- The site has good southerly exposure for sunlight and is located close to an existing solar demonstration site at the Landfill Gas Power Generation Facility;
- Has negligible or no impact to the surrounding roadways, flight paths, and neighbourhood area plans; and
- Is located near a connection to the City's power grid.

Visualizations of the project are provided in Appendix 1. An executive summary of the feasibility study is provided in Appendix 2.

The feasibility study explored several development and ownership options as previously identified in the November 2017 report. Following receipt of funding, the utility ownership model was necessary where Saskatoon Light and Power (SL&P) would finance, build, and operate the solar power plant, and supply the electricity to SL&P's distribution system to supply to its customers and offset purchases of bulk electricity from SaskPower.

Administration is currently engaging with CN Rail to finalize temporary and permanent site access requirements. The site landscape will be mowed and sprayed for weed control this fall in preparation for potential solar construction work in summer 2022.

### **Public Engagement**

In June 2021, the City conducted public engagement on the project. Several methods were utilized to connect with the public including:

- Direct mailout of project information to neighbouring residents and businesses;
- Sharing of information and collection of feedback through the City's website and social media platforms; and
- Hosting a live virtual public engagement meeting and answering questions on June 22, 2021.

Key outcomes from the public engagement are as follows:

- The survey conducted online received 49 responses, where 26 of them were residents of Montgomery Place;

- There were 45 responses on the benefits of the project. Of these responses, 28 supported renewable energy initiatives, 12 highlighted the project as a good use of vacant land, and 11 said the City was setting a good example;
- There were 43 responses with concerns about the project. Of these responses, 13 said their concerns were addressed, 7 were interested in the impacts on the green space/wildlife, and 5 were concerned with noise propagation;
- The presentation provided during the virtual engagement session answered most of the questions and concerns; and
- No significant issues were raised or remain that would prevent this project from moving forward.

A summary of the public engagement results is provided in Appendix 3.

An Indigenous group engagement was conducted as part of the ICIP government funding. Eight local Indigenous groups were contacted by mail for comments on the project. Only the Saskatoon Tribal Council (STC) responded, with the desire for the City to consider utilizing indigenous workforce on a portion of the construction phase of the project. The City and STC have collaborated on other projects and opportunities will be explored.

### **City of Saskatoon's Current Approach**

SL&P purchases bulk electricity from SaskPower and provides distribution services to customers within its franchise area. One of the main expenses incurred by SL&P is the cost of purchasing the bulk power (53% of total revenue). Any generation projects undertaken by SL&P are, therefore, required to offset equivalent costs of purchasing bulk power.

Due to the fixed franchise boundary for SL&P, land availability has imposed challenges to initiate utility-owned projects. However, SL&P has owned and operated a 1.6 MW Landfill Gas Power Generation Facility since 2014. SL&P also offers programs for customers to self-generate renewable energy and interconnect with the power grid. So far over 2.7 MW of solar has been approved through these programs.

Other related initiatives that support installation of green infrastructure and renewable energy include:

- The Home Energy Loan Program which provides loans to homeowners for energy improvements, including adding solar panels to their homes.
- A feasibility study is underway to add solar panels to civic buildings and sites. There are eight buildings being studied to find places that will work to install solar panels on City property.
- A feasibility study is planned to explore expansion of the Landfill Gas Power Generation facility to utilize increased gas volumes and generate additional renewable electricity to the power grid within the next four to eight years.
- Continued exploration of other opportunities to implement renewable energy projects within and outside of SL&P's electrical franchise boundary by ownership, co-ownership, or power purchase agreements.

- A GIS Implementation Plan is under development to outline various programs and initiatives in support of the actions identified.

### Approaches in Other Jurisdictions

According to Natural Resources Canada, solar accounted for 0.6% of Canada's electricity generation in 2018. It is anticipated that solar generation will increase significantly in future years as utilities across Canada reduce GHG emissions to meet federal environmental commitments.

In Saskatchewan, SaskPower is planning to construct 60 MW of utility-scale solar power in the coming years. The first project is a 10 MW installation (Highfield Solar Project) located near Swift Current that will be operational in the fall of 2021. Other SaskPower solar projects under construction include the 10 MW Foxtail Grove Solar Project, located in northeast Regina; 10 MW Pesâkâstêw Solar Power Project, located near Swift Current; and 10 MW Awasis Solar Power Project, located near Regina. Each of these projects will be built, owned, and operated by independent power producers, and in some cases in partnership with Indigenous groups or businesses.

Alberta has also seen a steady growth in utility-scale solar projects over the past few years and recently approved the 400 MW Travers Solar Project, which is the largest solar project planned in Canada.

### TRIPLE BOTTOM LINE EVALUATION

Appendix 4 provides a Triple Bottom Line (TBL) assessment in accordance with Council Policy C08-001 - Triple Bottom Line. The following options were reviewed:

1. Option 1: Implement Project Without Additional Landscaping
2. Option 2: Implement Project with Naturalized Landscaping
3. Option 3: Cancel Implementation of the Project

Option 2 scored the highest in all categories. It meets expectations in Environmental Health and Integrity, Economic Prosperity and Fiscal Responsibility, and Good Governance. Option 2 needs improvement in Social Equity and Cultural Wellbeing, because as a utility-owned and operated project, there are not many opportunities to impact social equity and cultural wellbeing indicators.

	Option 1: Implement Project Without Additional Landscaping	Option 2: Implement Project With Naturalized Landscaping	Option 3: Cancel Project Implementation
Environmental Health	12	21	-3
Social Equity	2	2	1
Economic Benefits	39	41	1
Good Governance	26	31	5
<b>Total TBL Score</b>	<b>79 Points</b>	<b>95 Points</b>	<b>4 Points</b>

### OPTIONS

Three options have been proposed for further consideration for the Dundonald Avenue Solar Farm project:

- Option 1: Implement Project Without Additional Landscaping
- Option 2: Implement Project With Naturalized Landscaping
- Option 3: Cancel Project Implementation

Evaluation of the options included the following considerations:

- The City has committed to 80% reduction in GHG by 2050. The City is deciding on the most effective ways to reduce GHG;
- This project achieves, and exceeds, LEC Action No. 30, which calls for the implementation of 1 MW utility-scale solar system on municipal land, and informs LEC Plan Action No. 34, which calls for the implementation of 20 MW of utility-scale solar system on municipal land in Saskatoon and surrounding areas within the next decade;
- This is the first utility-scale solar project in Saskatoon and will show environmental leadership;
- Eligibility for \$2.56 million of funding requires the project to be owned by the City and implemented by summer 2023; and
- Public engagement and feasibility study have not identified any major concerns with project.

### **Option 1: Implement Project Without Additional Landscaping**

Under this option, SL&P would build, own, and operate the 2.2 MW Dundonald Avenue Solar Farm for the 30-year life of the project. The project is estimated to cost \$4.25 million with \$2.56 million covered through government funding, resulting in a net total cost of \$1.7 million that would be funded from Capital Project 1955 – Utility Solar Scale Energy Implementation and budget reallocations that are proposed within SL&P’s submission for the 2022-2023 budget.

Electricity generated from the project would be fed onto SL&P’s electrical distribution system and would reduce bulk energy purchases from SaskPower. This would result in estimated average annual savings of \$300,000 and a simple payback period of 7 years. There will be no impact to customer power rates due to the project.

A solar development contractor would be hired through a competitive tendering process to design and build the solar farm. Construction of the solar farm is anticipated to occur in 2022 and be operational in 2023.

Under this option, the existing landscaping consisting of dryland grass would be retained. This would result in the need to continue mowing the grass to keep it manageable, and result in landscape maintenance costs of \$22,000 per year, or \$0.65 million over the 30-year life of the project, without any escalations in pricing.

Advantages of Option 1 are:

- Helps the City achieve its GHG targets by reducing electricity emissions by approximately 1,400 tonnes of CO<sub>2</sub>e in its first year, or 450 tonnes of CO<sub>2</sub>e annually

averaged over the 30-year life of the project, which is the equivalent of removing 97 cars from the road each year;

- It would provide over 2.7 million kilowatt-hours (kWh) of clean renewable electricity, which is enough to power over 330 homes;
- Senior government funding will be utilized to reduce initial construction costs and increase savings;
- There will be no impact to customer power rates as a result of the project;
- Savings from the project could be utilized to replenish SL&P's capital reserves and assist in funding asset management projects currently unfunded; and
- It allows the optimization of marginal land.

Disadvantages of Option 1 are:

- Some citizens opposed development of any solar on this site; and
- Retaining existing landscaping results in approximately four times higher operational and maintenance costs for the solar farm when compared with Option 2.

### **Option 2: Implement Project With Naturalized Landscaping**

This is similar to Option 1, with the exception that the existing landscape would be gradually reseeded and naturalized to include native grass and pollinator habitats along with the solar system. An additional upfront cost of approximately \$35,000 would be needed to establish the naturalized landscape and entail reduced mowing, cultivating, planting and weed control.

This option utilizes a combination of naturalized landscaping, Options B and C, identified under the landscaping considerations in Appendix 5. This approach was deemed most suitable to establish the given site, budget and implementation constraints.

Advantages of Option 2 are:

- In addition to the advantages listed in Option 1, this option would lower the operating and maintenance costs for landscaping by approximately three quarters once established, at an estimated cost of \$5,400 each year, or \$0.2 million over the 30-year life of the project without any escalations in pricing;
- Reduces operational GHG emissions associated with landscape maintenance;
- This option not only contributes to the City's sustainable goals and allows for biodiversity, but also aligns with the City's GIS on Naturalized Parks and Features; and
- Improves the visual appeal of the solar farm for observers.

Disadvantages of Option 2 are:

- Some citizens opposed development of any solar on this site;
- Initial establishment of naturalized landscape could interfere with the construction and operational phases of the project; and
- Naturalized landscape and pollinator habitats may be difficult to implement easily.

### **Option 3: Cancel Project Implementation**

Under this option, the project would be cancelled, and Administration would be directed to explore other opportunities to implement solar within the city.

Advantages of Option 3 are:

- Some citizens may be in favour of keeping things the same at the proposed solar site.

Disadvantages of Option 3 are:

- Lost opportunity to implement solar and renewable energy at the largest available marginal land within SL&P's electrical franchise boundary;
- Lost opportunity to utilize available funding to offset capital costs for the project;
- Loss of potential savings that could increase SL&P capital reserves;
- The City would not be meeting its environmental goals. There would be no reduction of greenhouse gases from the current state; and
- The City would continue to purchase all required electricity from SaskPower rather than generate a portion of its own.

#### **RECOMMENDATION**

That the Standing Policy Committee on Environment, Utilities and Corporate Services recommend to City Council:

1. That Option 2, Implement Project With Naturalized Landscaping, be approved under Capital Project P.1955 - Utility Solar Scale Energy Implementation;
2. That \$0.2 million from Capital Project P.1286 - Electric System Planning Studies be reallocated to Capital Project P.1955; and
3. That \$0.2 million from Capital Project P.1281 - Investigate New Power Supply be reallocated to Capital Project P.1955.

#### **RATIONALE**

##### Positive Impact on City Goals

City Council has identified Environmental Sustainability as one of its priority focus areas. The recommended Option 2 allows the City to move toward these goals and help lower GHG emissions within Saskatoon. Option 2 achieves LEC Action No. 30, which calls for the implementation of a utility-scale solar system on municipally owned land within Saskatoon. The project would also inform LEC Plan Action No. 34 which requires the implementation of 20 MW of utility-scale solar system on municipal land in Saskatoon and surrounding areas within the next decade.

Option 2 also supports naturalized landscaping which would enhance ecosystem services, improve long-term maintenance, and support biodiversity.

### Utilization of Government Funding

The utility ownership model will ensure the City remains eligible for the \$2.56 million of government funding for implementation of the project. Access to funding significantly reduces the simple payback period from 15 years to 7 years.

### Positive Impact on the Utility

The project is estimated to generate an average of over 2.7 million kWh of clean electricity each year across its 30-year life. This is the equivalent energy needed to power 330 homes.

### Optimal Utilization of Land

In 2017, SL&P investigated all available/vacant lands within its franchise boundary and identified Parcel M as the largest and most suitable land for solar development, and subsequently reserved the land for future solar development.

The land is ideal for solar for the following reasons:

- It is marginal land that is not suitable for commercial, residential, or recreational development;
- Has access limitations due to its proximity with the railway line to the west and Circle Drive South freeway to the east;
- Has minimal impact on nearby community local area plans;
- Has excellent south exposure and is located near the City's existing Solar Demonstration site; and
- Is easy to connect with the electrical distribution system nearby.

### **FINANCIAL IMPLICATIONS**

The project is estimated to cost \$4.25 million, with \$2.56 million covered through government funding, resulting in a net total cost to the City of \$1.7 million which would be funded from Capital Project 1955 – Utility Solar Scale Energy Implementation and budget reallocations that are proposed within SL&P's submission for the 2022-2023 budget. Reallocation of funds from two existing capital projects in the amount of \$0.4 million is also proposed to ensure adequate funds are in place.

The project is estimated to have a simple payback period of 7 years taking into account the federal and provincial funding, with estimated annual savings of \$300,000 expected over its 30-year life.

The final cost of the project will be determined through the competitive tender process. Utilization of naturalized, low-maintenance landscapes will reduce associated maintenance costs throughout the project's life.

### **ADDITIONAL IMPLICATIONS/CONSIDERATIONS**

This project needs the collaboration of several civic departments, including Transportation, Saskatoon Land, Sustainability, Parks, Communications, Saskatoon Water, Planning and Development, Solicitors, Saskatoon Fire, and Building Standards. This project's progress is dependent on negotiations with CN Rail for a permanent



access point into the site. Applications are being made to gain a permanent entrance from Dundonald Avenue.

### Broader Economic Impacts

SREDA was also consulted to determine economic benefits from the project for the City with the results in Appendix 6. The direct output is \$4.25 million with an indirect output of \$1.27 million, and an induced output of \$0.78 million. There would be about 24 FTE jobs created during construction.

### Other Site Considerations

The entire site will be fenced and gated for safety. A glare study was conducted to ensure that there will be no dangerous reflections from the sun. Glare from the solar panels is expected to be less than glare from snow in winter. A noise study was also conducted, and it was concluded that the solar farm will have a neutral impact on sound transmission from traffic on Circle Drive South. The solar farm itself will not produce any discernable noise.

A climate resilience assessment was also conducted as part of the ICIP funding process. Consideration for climate resiliency will be included in the design and construction phases of the project.

A high-level assessment of a Battery Energy Storage System was also performed and deemed not desirable due to added cost and risk associated with the technology.

### Montgomery Place Impact Considerations

There will be no impacts to existing local area plans to Montgomery Place. Furthermore:

- Existing Montgomery Place local area plan recommendations for completing a noise study in 2023 remain unchanged;
- Potential future noise mitigation measures are not impacted by the solar farm; and
- Potential future overpass considerations along 11th Street West are accommodated for within the land reserved for future roadways.

## **COMMUNICATION ACTIVITIES**

The following communication activities are planned following direction from City Council:

- The engage website will be updated to reflect the decision of City Council;
- The SL&P website will be set up to inform the public of the progress of the project if implementation is approved;
- Neighbouring community and businesses will be informed prior to and during construction;
- A news release will be issued when construction on the project begins; and
- A news release will be issued when the project is operationalized.

## **NEXT STEPS**

If implementation is approved, the next steps on the project are:

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- Issue a tender document for a design/build contract in Q4 2021;
- Finalize site design in Q1 2022;
- Commence construction in Q2 2022; and
- Complete construction and commission by Q3 2023.

### APPENDICES

Appendix 1: Dundonald Avenue Solar Farm Layout and Visualizations

Appendix 2: Dundonald Avenue Solar Farm Stantec Feasibility Study Executive Summary

Appendix 3: Dundonald Avenue Solar Farm Public Engagement Summary

Appendix 4: Dundonald Avenue Solar Farm Triple Bottom Line Assessment

Appendix 5: Dundonald Avenue Solar Farm Landscaping Considerations

Appendix 6: Dundonald Avenue Solar Farm SREDA Economic Impact Study

### Report Approval

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