



File #: AR-20-210, **Version:** 1

TAMRMS#: B06

Solar Farm Business Case

Presented by: Kate Polkovsky, Director, Utilities and Environment Department

RECOMMENDATION(S)

That Community Growth & Infrastructure Standing Committee recommend to Council that:

1. That \$200K is funded from the stabilization reserve to support the preliminary and detailed design requirements of the full-scale Solar Farm.
2. That Administration provide an update to Council, upon the completion of the detailed design of the Solar Farm, by Q2 2021.
3. That a borrowing bylaw be brought forward to support the implementation of the presented Solar Farm Business Case in 2021.
4. That Badger Lands be allocated to support the long-term development of solar as a green industry within the City.
5. In 2021, Administration be directed to bring back a report to rescind all previous Council motions pertaining to the Badger Lands that are not consistent with dedication of those lands to development of a solar power industry in St. Albert.

PURPOSE OF REPORT

To provide Council with the opportunity to contemplate a project that could yield to long term revenue opportunities, a program identified within their Strategic Plan.

ALIGNMENT TO COUNCIL STRATEGIC PRIORITY

Strategic Priority #4: Infrastructure Investment: Identify and build needed capital assets.

Identify sustainable (environmental, economic, social) alternative servicing opportunities, considering net environmental effects, to reduce environmental receptors' impact, reduce servicing costs and generate revenue.

ALIGNMENT TO SERVICE DELIVERY

Strategic Priority #4: Infrastructure Investment: Identify and build needed capital assets.

Identify sustainable (environmental, economic, social) alternative servicing opportunities, considering net environmental effects, to reduce environmental receptors' impact, reduce servicing costs and

generate revenue.

ALIGNMENT TO COUNCIL (OR COMMITTEE) DIRECTION OR MANDATORY STATUTORY PROVISION

At the July 8, 2020 COVID-19 Recovery Task Force meeting the following motion was approved:

Moved by D. Holman

That the Covid-19 Recovery Task Force supports the concept of the Utility Scale Solar Farm as a revenue generating opportunity that will free up resources that will support the Covid-19 recovery.
CARRIED UNANIMOUSLY

BACKGROUND AND DISCUSSION

The incorporation of long-term revenue generating opportunities for the City has the potential to support the long-term Strategic Plan of Council. Administration has examined the 20 year growth of solar throughout the City as a method for incorporating reasonable residual revenue to support the asset costs and overall City expenditures as the asset inventory is built.

Midscale microgeneration projects could be contemplated with payback periods in the 7-10 year range without considering the use of solar grants. Additionally, what will expedite payback and continue to add to the revenue stream is Carbon offset, which after you calculate GHG intensity, offset sale price, brokerage, and certification, the revenue in today's market is roughly \$8.68 (\$/MWH) (2020). Doing the complete calculations, you would generally be looking at offsetting approximately 3,500 tonnes/year of carbon. Yielding a revenue annually of approximately \$1M including carbon offset and energy sales, prior to allocating debenture payments from the revenue stream. Maintenance and operations is generally relatively low as there are no moving parts and the estimated operating costs of \$30,000 includes the overall mowing and snow clearing of the site.

The long-term planning of a series of micro-generating solar farms, or green industry, could provide the City with an efficient passive revenue to support growth or RMR for the City as traditional funding mechanisms are modified. This could be handled within the existing Environment department portfolio without any corporate changes.

AR-19-491, required that Administration present to Council by end of Q2 2020, a proposal for the future use or disposition of the Badger Lands. This opportunity is identifying the use of a total of approximately 15 acres of land at the north end of Badger Lands to utilize for the long term siting of a solar farm. Council could chose to continue to grow the solar portfolio within these lands, if they so chose. The siting of three 5MW systems on three 5 acres parcels within the Badger Lands area over a 15 year period, would incrementally grow a passive revenue source, allowing a Green Farm to support the financial sustainability of the community. This would not limit the long term growth of this portfolio if supported. Not all lands provide good suitability for solar development and the topography, existing electrical infrastructure in proximity and the use of this brownfield provides an opportunity to invest and create revenue within this area.

When assessing sights to place Solar developments there are a number of factors that must be

considered to support these developments. A few of the site considerations are:

- Proximity to grid interconnections,
- Topography,
- Geotechnical considerations, and
- Setbacks.

There is a relatively robust interconnection application process with the electrical provider that is set out to support these programs throughout Alberta from the pre-application process to the constructing and energizing processes.

Administration would begin the process with a pre-feasibility investigation, which provides a contextual investigation of a number of areas critical to the overall siting of a solar development. The first phase would examine the land suitability (eg. Badger Lands, and the optimization of salt contaminated lands for a revenue venture) and any conflicts with the existing uses, yielding a conceptual site plan. A high level environmental investigation would then be completed examining wildlife and their natural movements within the area, any prevalent wetlands, industry, and proximity to existing uses. Summary results would be compiled in a desktop study for the program. At this stage the infrastructure investment to support the asset is examined, including grid connection, access roads, and operation and maintenance requirements based on size, location, and design parameters as compiled in a conceptual summary study. Regulatory requirements can then be examined within the project critical path providing the tariff and interconnection strategy. In order to provide this strategy, the generation regulations must be reconfirmed, Distribution Facility Owner (DFO) tariffs, and any provincial/federal legislation that could impact the project progression.

Once the above outputs have been compiled, the specified scope can be created which will provide a break down into specific technology, scale, and configuration. This information is compiled in a Design Basis Memorandum, providing class 5 cost estimates and a level 1 schedule for completion. This first phase of the project provides the feasibility and roadmap, once the project team has that check point the more detailed assessment can occur.

Phase 2 of the project would provide a number of decision points to optimize the project. The technology assessment, scale in regard to modules and acreage, as well as the physical and electrical layouts will provide the necessary inputs into the creation of the Engineering Design, the Energy Output Forecast, necessary losses modelling, and a Class 3 Cost Estimates. Phase 2 would also consider the feeder system, the substation, capacity, and required regulated studies providing the technical data for the detailed schedule and estimates for the program (eg. Environmental, glint/glare, noise, historical, etc.). Finally, the project would move into the detailed revenue strategy, detailed financial modeling, and the overall project cash flow model.

Conceptually the City has completed a financial cash flow model of the 15 year capital investment and attributed revenue based on the sale of electricity directly to the grid. The conceptual model has incorporated debenture payments, and attributed bottom line revenue that could be applied to support programs within the City. The model has been projected for 25 years, and the cumulative profit equates to approximately \$29M, Attachment 3 provides the conceptual graphics. Although the financial model has been completed for a 25 year period, these systems will continue to provide revenue opportunities for up to 35 year years and a phased rehabilitation could be incorporated to plan

for the subsequent 25 year. Annual revenues are shown in the Attached graph and table. Attributed operation and capital costing are attached in Table 1.

If the project was contemplated there are a number of existing federal grant opportunities that would be examined and explored to support the program, however they have not been considered in the preliminary financials at this time. Availability and timing would be based on what was available as the project critical path merged towards construction.

Overall there are a number of solar farm investments that have occurred throughout the province over the past few years, providing their host communities, residual revenue opportunities to support their long term financial sustainability. Table 2, shows a listing of a few examples of recent solar programs throughout the province of Alberta, additionally solar mapping of the Country is maintained on <https://solaralberta.ca/case-studies> providing some context for the number of solar installations, when comparing and examining similar case studies throughout the province it is critical to compare similar technologies, Solar PV versus Concentrated Solar.

STAKEHOLDER COMMUNICATIONS OR ENGAGEMENT

N/A

IMPLICATIONS OF RECOMMENDATION(S)

Financial:

The initial stages of this project requires a financial commitment of \$200,000 which is recommended to come from the Stabilization fund. The current uncommitted balance of this reserve is \$1.34 million.

Legal / Risk:

N/A

Program or Service:

N/A

Organizational:

N/A

ALTERNATIVES AND IMPLICATIONS CONSIDERED

There are a myriad of alternative investment projections that could be contemplated from reducing the investment or increasing the investment.

Report Date: July 13, 2020

Author(s): Kate Polkovsky

Department: Utilities and Environment

Deputy Chief Administrative Officer: Kerry Hilts

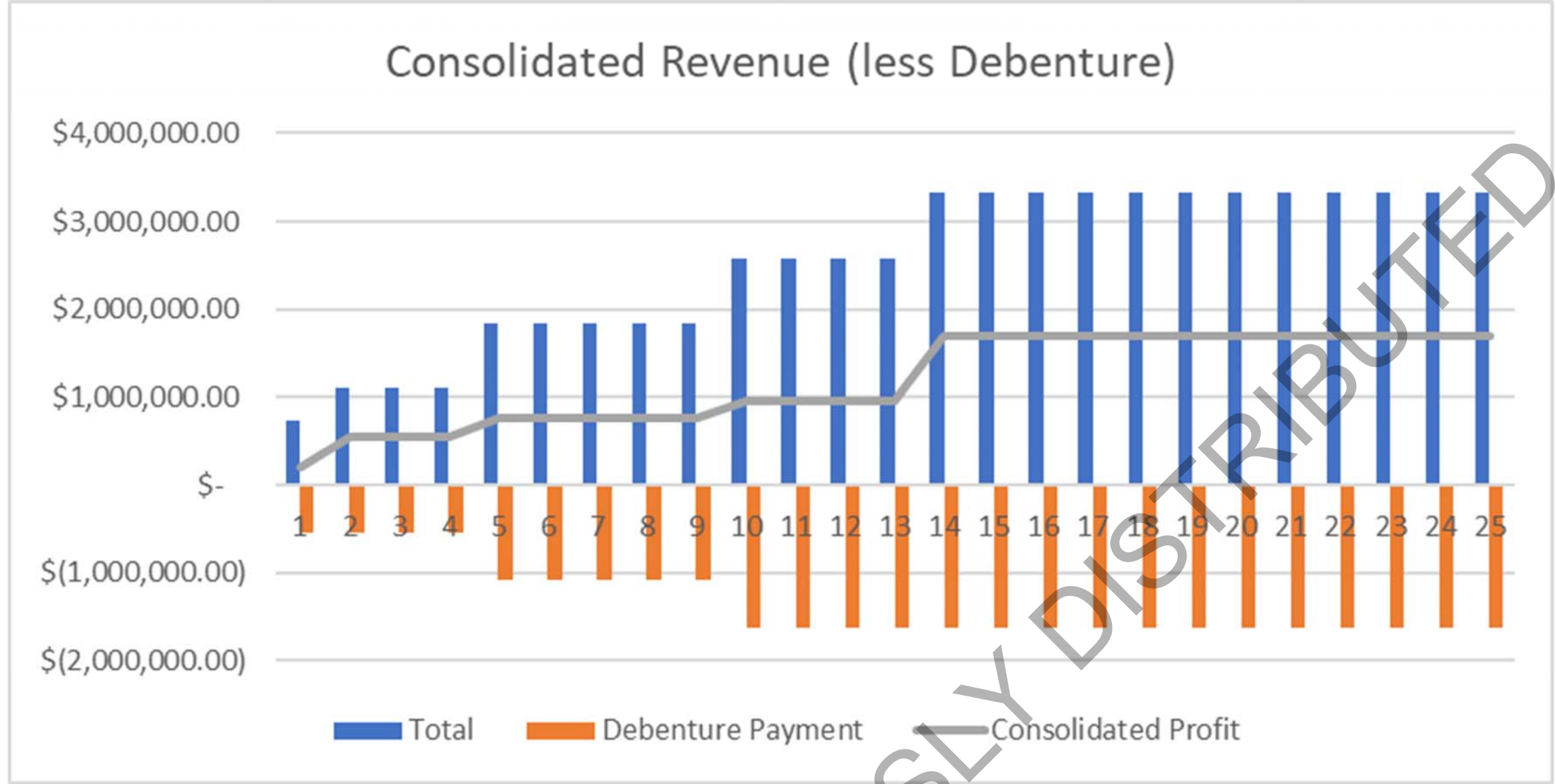
Chief Administrative Officer: Kevin Scoble

SUMMARY Costs

	<u>2021</u>	<u>2026</u>	<u>2031</u>
System Design and Detailed Engineering	600,000	300,000	300,000
PV Panels	2,600,000	2,600,000	2,600,000
Inverters	630,000	630,000	630,000
Foundations and Racking	2,200,000	2,200,000	2,200,000
Electrical	3,520,000	3,520,000	3,520,000
Site work (road, fence, common excavation)	300,000	100,000	100,000
SCADA	50,000	25,000	25,000
Project Management	250,000	250,000	250,000
Contingency	1,485,000	1,406,250	1,406,250
Total	11,635,000	11,031,250	11,031,250

Table 2, Alberta Solar Programs

Name	Municipality	Cost	Stage	Schedule
Canadian Solar, Solar Solutions	Newell County, Special Area No.2, Taber	\$100.0M	Proposed	2020-2021
E.E. Smith Solar Farm	Edmonton	\$32.0M	Proposed	2020
Fort Chipewyan Solar Farm	Wood Buffalo	\$7.8M	Under Construction	2019-2020
Shaw Conference Center Solar Panels	Edmonton	\$6.3M	Under Construction	2019-2020
South Calgary Solar Farm	Calgary	\$50.0M	Proposed	
Suffield Solar Project	Cypress County	\$49.0M	Under Construction	2019
Travers Solar Project	Vulcan County	\$500.0M	Proposed	2020-2021
Vulcan Solar Project	Vulcan County	\$155.0M	Proposed	2020-onward



[illegible]