

CAPITAL PROJECT CHARTER

YEAR:	2022
CHARTER NUMBER:	ENV-004
CHARTER NAME:	Solar Photovoltaics (PV) Farm
LEAD DEPARTMENT:	Utilities & Environment

TYPE:	<input type="radio"/> RMR <input checked="" type="radio"/> GROWTH	
	The project is a growth capital as it involves the additional phases of design, electrical interconnection and installation of new technologies that provides opportunity for investment in long term revenue generating infrastructure.	
ASSET CATEGORY:	<input type="radio"/> Civic Facilities <input type="radio"/> Master Plan, Studies, & Other <input checked="" type="radio"/> Roads & Other Engineered Structures <input type="radio"/> Historical/ Cultural	<input type="radio"/> Parks & Trails <input type="radio"/> Mobile & Other Equipment <input type="radio"/> Land & Land Improvements
SCOPE STATEMENT:	Project includes the final phases of detailed design, electrical interconnection and installation of a solar photovoltaic farm on Badger Lands located at 43 Villeneuve Rd.	

PROJECT CHARTER JUSTIFICATION:	<p>At the July 8, 2020 COVID-19 Recovery Task Force meeting the following motion was approved and carried:</p> <p><i>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.</i></p> <p>On August 17, 2020 council passed the motion that directed Administration to move forward with the feasibility study, preliminary and detailed design requirements of the full-scale Solar Farm.</p> <p>In early 2021, the City of St. Albert retained ATCO to provide engineering services for a potential solar photovoltaic (PV) energy project at the City owned Badger Lands site, which is located at Lot 43 on Villeneuve Road. ATCO's engineering, environmental and civil/survey teams have completed their reviews.</p> <p>The Badger Lands site is a suitable candidate for a solar energy project based on a site suitability comparison with other sites that the City of St. Albert had identified. As a brownfield site (i.e., one previously used for commercial or industrial purposes), Badger Lands presents a unique</p>
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opportunity to repurpose land that is contaminated due to previous City operations. In addition, there are no large open-body wetlands in the site's vicinity and no historical resource values. The proximity to a transmission point of delivery substation is also a major benefit that will reduce the overall cost of the project.

After examining the FortisAlberta interconnection process for distributed energy resources (DERs) and other approvals needed, ATCO recommends that the City proceed to build this solar energy project in one 15 MW phase. Splitting it into three separate 5 MW phases will involve added costs and time with approvals, project management fees, design cost, time and operations and maintenance complexities. The FortisAlberta interconnection process is long and costly, so beginning a Phase 1 DER interconnection application and high-level study early is recommended, as it is a critical path item.

ATCO has developed a preliminary site plan for a solar farm on Badger Lands. The solar farm is separated into three arrays, roughly 5 MW each; however, it is recommended that they be combined into one 15 MW interconnection. The proposed design has a total array size of 18.2 MWDC / 13.8 MWAC, consisting of 34,350 individual bi-facial modules, individually rated to 540W, 30 ft row spacing and 35-degree tilt angle. The array will be housed on a on a fixed racking system secured on helical screw piles, which are the typical solar racking foundation for ground mount solar. They are spiral-shaped steel pipes that have either plates or holes to which the solar panel brackets and railings are attached. The advantage of helical piles for foundations is that they can be installed in any soil condition and provide solid and robust footings for solar modules that may be subject to high wind and snow loads.

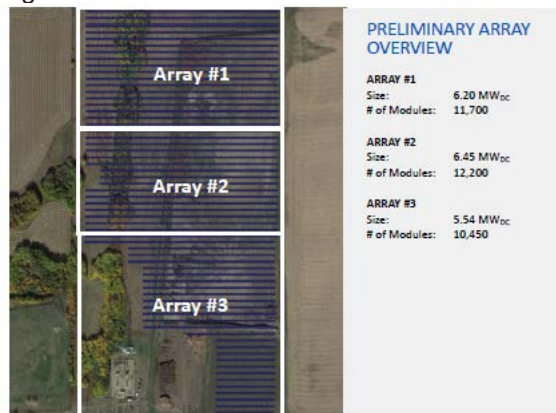


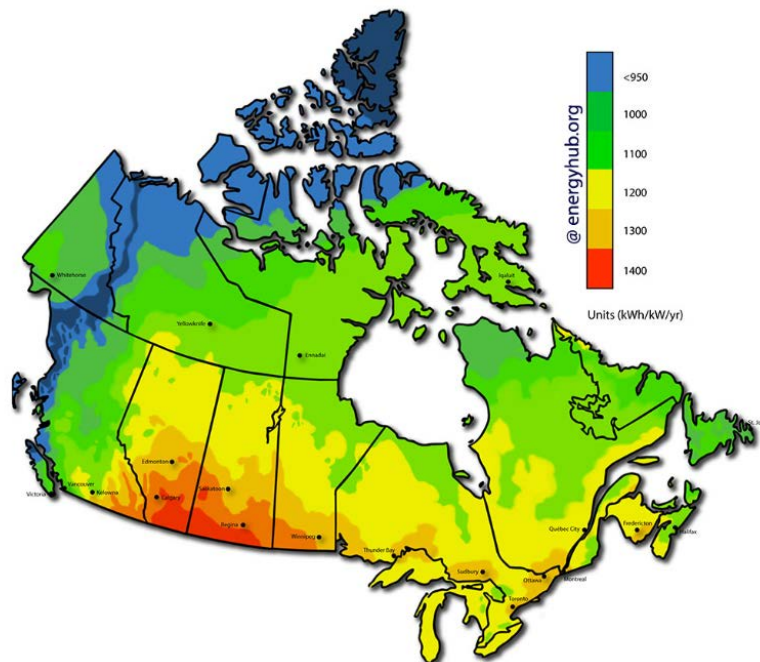
Figure 13: Badger Lands Preliminary Site Plan

With all approved regulatory studies and requirements completed, the solar PV farm has an estimated construction start date in July 2022 with commissioning occurring in April 2023. Please note that this is a preliminary plan only and is subject to change upon equipment selection, costs, future infrastructure plans and City input.

If installed, the proposed solar PV installations are expected to pay for themselves within its life cycle. In addition, solar PV provide certainty of electricity costs, avoidance of carbon tax costs, reduction in greenhouse gas emissions, aligns with the implementation of Smart City technologies and advances the community sustainability vision of St. Albert by shifting to renewable fuel sources.

A solar photovoltaics (PV) system employs solar panels to transform energy from the sun into useable electricity. The systems that are being recommended here are a utility scale solar farm, grid connected systems. Alberta has some of the best solar production potential in Canada. The map below is a solar energy maps, which is a visual representation of the amount of energy that a solar PV system can produce based on the intensity of light that reaches the Earth's surface. This is called *Solar Production Potential*. In Alberta, you need less solar panels to produce the same amount of energy than in a province with a lower solar energy potential.

The maps are presented in units of kWh/kW/year which details how much energy (in units of kWh) can be produce per year given the size of the solar power system (in units of kW).



ATCO has also identified annual operation and maintenance costs (O&M) of approximately \$120,000.00 per year and a one-time equipment replacement costs of the invertors at year 15 of an estimated \$1,300,000.00. These costs can be offset as an expected cost through the annual revenue from the solar PV farm.

Through proprietary financial modeling, ATCO and their partner Boost Energy Ventures have identified and modelled a net revenue of \$41M over the lifespan of the infrastructure, considering operation and maintenance, debenture costs, and decommissioning.

Solar PV's benefits go beyond financial payback as solar provides deep carbon reductions, avoids carbon tax, promotes a transition to renewable energy and smart technologies and reduces the risk associated with potentially volatile and escalating electricity prices. This program supports many of the goals within the Environmental Master Plan and the Pillars of Sustainability throughout the City.

STRATEGIC PLAN & CORPORATE BUSINESS PLAN ALIGNMENT:	Council Priority: 4. Infrastructure Investment Activity: 7.1 Facilitate the Recovery Task Force to develop the City's recovery conceptual plan Administrative Priority: A.4. Business Process Improvements Activity: N / A		
STAKEHOLDER IDENTIFICATION:	Phase 1 Technical Memorandum identifies the legislative and regulatory requirements for stakeholder engagement through the application process. Stakeholder communications and engagement will start in Phase 2 of detailed design and continue through to Phase 3.		
TIMELINE:	2021-22 – Detailed Design and Fortis Alberta DER application process (Phase 3 -5) 2022-23 – Installation and commissioning of the Solar PV Farm		
FINANCIAL INFORMATION:	Investment Year		
	2022	\$	26,100,000
	2023		
	2024	\$	-
	2025	\$	-
	2026	\$	-
	2027	\$	-
	2028	\$	-
	2029	\$	-
	2030	\$	-
	2031	\$	-
	Total	\$	26,100,000
	See Capital Project Worksheet for details.		
OPERATIONAL IMPACTS:		<input checked="" type="radio"/> Yes <input type="radio"/> No If yes, refer to Operating Impacts Worksheet for details.	
ASSOCIATED OPERATING BUSINESS CASE:		N/A	

APPROVAL

Author:	Micah Seon-King	June 9, 2021
	Project Charter Developer	Date
Director:	Kate Polkovsky	June 9, 2021
	Director	Date

CAPITAL PROJECT WORKSHEET

PROJECT COMPONENT	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Land Determined Costs										
Concept Planning										
Detailed Planning and Design	250,000									
Site Servicing	800,000									
Strucure/Building Construction	24,647,834									
Landscaping										
Construction Management	150,000									
Commissioning and QA/QC										
Contingency	252,166									
Public Participation Activities										
Equipment										
TOTAL	26,100,000	-	-	-	-	-	-	-	-	-

Please note Public Art is budgeted separately on the Ten-Year Capital Plan.

Comments:

OPERATING IMPACTS WORKSHEET

<input checked="" type="radio"/> One Time <input type="radio"/> Ongoing	Annual operation and maintenance costs (O & M) of approximately \$120,000/yr and one equipment replacement costs of the invertors at year 15 of an estimated \$1.3 million. These costs will be offset as an expected cost through the annual revenue from the solar PV farm.
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OPERATING IMPACTS	2024	2025	2026
Annual maintenance costs - Utilities department	120,000	120,000	120,000
TOTAL	120,000	120,000	120,000