

WESTBROOK SOLAR

SunE Westbrook Solar Farm

Executive Summary



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1. Background

SunEdison Canada is proposing to construct a 10-Megawatt (MW) (AC) ground-mounted solar PV (photovoltaic) project in the area of Westbrook (Kingston), Ontario. The project is being developed under Ontario's Feed-in Tariff (FIT) program and is a Class 3 Solar Facility. As such, the project needs to complete the Renewable Energy Approval (REA) process and receive an REA from the Ontario Ministry of the Environment. This collection of documents has been compiled to document the work undertaken as part of the REA process.

2. Project Developer

The SunE Westbrook Solar Farm is being developed by SunEdison Canada, LLC (SunEdison). The project will be owned and operated by SunE Ray LP, which is majority owned by SunEdison. SunEdison is North America's largest solar energy services provider. The company finances, installs and operates distributed power plants using photovoltaic technologies, delivering fully managed solar energy services for its commercial, government and utility customers. SunEdison is a global leader in solar energy generation with a current operating portfolio of more than 350 facilities generating over 100 Megawatts (MW) of solar power across the globe. Active Ontario solar farms currently owned and operated by SunEdison include First Light 1 (9.1 MW) located in Stone Mills, north of Napanee, Norfolk I and II (18 MW combined) located in Norfolk County and Erie Ridge (9.3 MW) in Ridgetown, Chatham-Kent.

3. Project Location and Size

The project site will cover approximately 70 hectares of agricultural zoned land located on Burbrook Road, near Westbrook, in the City of Kingston, Ontario. The area is generally bounded by:

- Westbrook Road to the east
- Glenvale Creek along the west

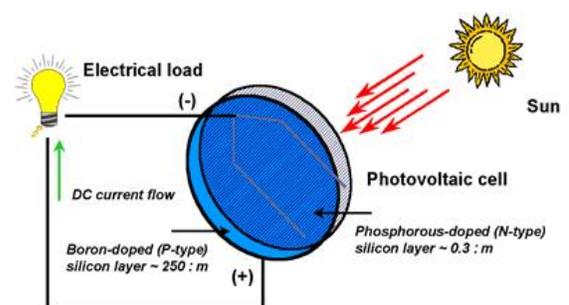
The proposed project will have a nameplate capacity of 10 MW (AC) which will be produced by approximately 40,000 solar panels. The project's electrical substation will also be located on site. One overhead electrical connection line would run south within the Westbrook Road right-of-way to connect to the existing Hydro One distribution line running east-west along Princess Street. The study area and site plan are shown in Figures 1 and 2 in Appendix A.

The proposed schedule is to have the units operating by the Fall 2013.

4. Project Equipment

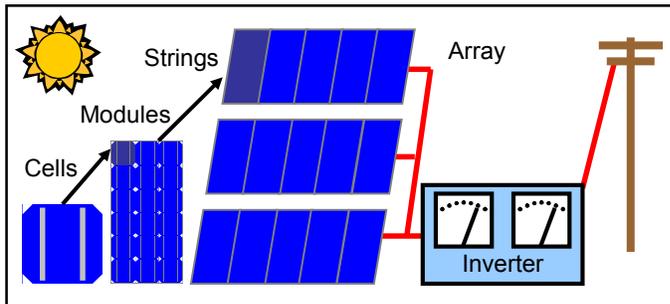
4.1 Solar PV Technology

The photoelectric effect relies on the principle that whenever light strikes the surface of certain materials electrons are released. PV systems use cells to convert solar radiation into electricity. The cell consists of one or two layers of a semi-conducting material. When light shines on the cell it creates an electric field across the layers, causing electricity to flow. The greater the intensity of the light hitting the cells, the greater the flow of electricity. However, a PV system does not need bright sunlight in order to operate and it can generate electricity even on cloudy days. PV cells perform even better at low temperatures. This technology is thus perfectly suited to Ontario's climate.



The most common semi-conductor material used in PV cells is silicon, an element most commonly found in sand and which is the second most abundant material in the Earth's mass. PV systems produce direct-

current (DC) electricity, which must be 'inverted' to alternating current (AC) and stepped-up before it can be delivered to the electricity grid. PV systems connect to the lower-voltage distribution lines commonly found along roadways; not to high-voltage transmission lines.



5. Approvals Process

The Ontario government introduced the Green Energy Act in May 2009 to boost renewable energy development and increase energy conservation in the province. The key drivers behind the new legislation were Ontario's commitment to phase out coal generation by 2014, the goal of boosting economic activity and the creation of new green industries and jobs. Two major components of the legislation include the FIT program and the REA process. The FIT program is managed by the Ontario Power Authority and is designed to encourage the development of renewable energy projects. The FIT program sets specific rates for energy generated from renewable sources and provides long-term contracts (20 years for solar PV) to provide stability for developers and the financial community. FIT contracts are awarded, in part, based on transmission grid capacity and the ability of the proponent to bring renewable energy projects online quickly.

For solar PV, the FIT program also requires a minimum amount of goods and services to come from Ontario – called domestic content. For the SunE Westbrook solar farm 60% of the goods and services going into the project must come from Ontario.

The REA process is overseen by the Ministry of the Environment (MOE) and prescribes a standardized environmental study, review and approvals process that proposed renewable energy projects need to complete before they can be approved for construction. Key aspects of the REA as outlined in Ontario Regulation 359/09, as amended, include:

- Requires that proponents consider natural heritage and water features when developing projects
- Requires that proponents consider archaeological and built heritage features when developing projects
- Ensures that public input is sought and considered when developing projects
- Mandates consultation with Aboriginal groups
- Ensures that municipal governments are consulted and that local input is considered

6. REA Reporting

Ontario Regulation 359/09 lays out the required documentation for a solar PV REA. Five main reports are required, namely:

1. A Project Description Report providing an overview of the project
2. A Construction Plan Report detailing construction activities and potential effects
3. A Design and Operations Report describing the design, operation and emergency plans

4. A Decommissioning Report describing how the solar farm will be removed at the end of its lifespan
5. A Consultation Report that documents the consultation process followed and feedback received during the study

Each of these REA reports is included as a separate section of the SunE Westbrook Solar Farm REA documentation package.

6.1 REA Project Schedule

Initial Public Meeting:	August 17, 2011
Final Public Meeting:	May 3, 2012
Submission of the REA Application:	May 17, 2012
Commence Construction:	Early 2013
Commercial Operation:	End of 2013

7. REA Studies

As part of the REA process, a number of detailed studies needed to be completed to assess the current environmental conditions and potential impacts of the proposed project. These included:

- A Natural Heritage study investigating significant woodlots, wetlands, wildlife habitat and species at risk (Appendix C)
- A Water Bodies study investigating watercourses and water bodies in the study vicinity (Appendix C)
- An Archaeological and Built Heritage study to determine if any archaeological or built heritage sites are present in the development area (Appendix D)
- A Noise study to assess potential transformer and inverter noise levels on surrounding properties (Appendix E)

Each of these studies is documented in the individual appendices noted above accompanying the REA documentation. A summary of the key findings of these studies is also provided in the following subsections.

In addition, background information on the Consultation undertaken as part of the REA is included in Appendix F and Technical Support Documents are included in Appendix G. These Technical Support Documents (Stormwater Management Plan report, Groundwater Monitoring Plan report, Geotechnical Study and Soils Capability) are not required by the REA process but they provide information to assist in assessing the existing and proposed conditions and environmental effects of the project.

7.1 Natural Heritage Studies

7.1.1 Studies Completed

This study was completed to assess the current environmental site conditions and to meet the requirements of the Ministry of Natural Resources under the Green Energy Act. The study is composed of two portions: 1) a records review; and 2) a field program. The records review involved obtaining information from the Ministry of Natural Resources, municipal governments and the Cataraqui Region Conservation Authority to determine if there are any significant woodlots, wetlands, valley lands, wildlife habitat or presence of Species at Risk (SAR) in the study area. The purpose of the field program was to confirm the information obtained through the records review, to evaluate the woodlots, wetlands and wildlife habitat to determine if it meets the Ministry of Natural Resources criteria for significance and to update the available information. The field program involved visits to the site in summer and fall of 2011.

7.1.2 General Findings

The studies identified water features, wetlands and woodlots within the study area which are shown in Figure 2. The site to be developed is zoned agriculture and is characterized by thickets in the southeast and southwest portions, grassland (alvar) and cedar mixed forests through the center of the property and wetlands dominating the northern portion of the site. General findings on the condition of the site include:

The natural features were evaluated for their significance (*Natural Heritage Assessment Evaluation of Significance Report*, Appendix C) and the following significant natural features were identified:

- Two significant wetlands (Glenvale Creek Wetland and Mature Maple Mineral Swamp), neither of which will be directly impacted by the proposed project;
- One rare vegetation community (Alvar), which will not be directly impacted by the proposed project;
- Shrub/early successional bird breeding habitat;
- Woodland raptor nesting habitat; and
- Amphibian breeding and movement habitat

The project has been designed to avoid natural features and wildlife habitat as much as possible and to minimize impacts on natural features and wildlife habitat may be affected during construction due to site grading or other earth-moving activities, accidental spills, removal of vegetation or direct loss of areas.

The Natural Heritage Report was accepted as complete by the Ministry of Natural Resources in January 2012.

7.2 Water Bodies Study

7.2.1 Studies Completed

This study was completed to determine if there were water bodies within the project area and to meet the requirements of the MOE under the Renewable Energy Approvals regulation (O.Reg. 359/09, as amended). The study is composed of two portions: 1. A records review; and 2. A field program. The water body studies noted that the property has two water features in the vicinity including Glenvale Creek which runs around the western boundary of the property and an unnamed intermittent tributary of Glenvale Creek which crosses the southeastern portion of the property. Site investigations were undertaken in summer of 2011.

7.2.2 General Findings

The records review identified Glenvale Creek (along western boundary of the property) and an unnamed tributary crossing the southeastern portion of the property. A field inspection showed that these water features did exist within 120m of the project location. The study has concluded that the project location is within 120 m of any water feature and as such the following setbacks should be observed:

- 30 m setback from the Glenvale Creek Wetland and Mature Maple Mineral Swamps;
- 30 m setback from the unnamed watercourse crossing the southeastern portion of the property; and;
- 120 m setback from Glenvale Creek.

7.3 Archaeological and Built Heritage

Under the REA Regulation, consideration must be given to the potential impact which the project may have on Archaeological and Heritage resources as well as Protected Properties. The following sub-sections detail the examination of the potential for impacts on these resources.

7.3.1 Consideration of Protected Properties and Heritage Resources

A records review was undertaken to determine if there were any built heritage resources such as historical buildings or landscapes at the project location which may be impacted by the proposed project. The review noted that there are no protected properties within 125 m of the project area.

7.3.2 Consideration of Archaeological and Built Heritage Resources

A desktop study (Stage 1 Assessment) was completed to determine the location of existing recorded archaeological resources and to determine the archaeological potential for the proposed solar site. This study was conducted in accordance with the *Draft Standards and Guidelines for Consultant Archaeologists* (MCL 2009). The study revealed there are no recorded archaeological sites in the subject area. However the property exhibits potential for recovery of archaeological resources of cultural heritage value.

As a result, a field (Stage 2) archaeological survey was completed. The characteristics of the property dictated that the Stage 2 survey be conducted by test pit survey. The Stage 2 property assessment did not result in the identification of archaeological resources.

A Built Cultural Heritage study was completed in January 2012 and found the project has the potential to impact identified cultural heritage resources in a variety of ways. These are significant and important resources which provide unique and vital information about the settlement of the former Kingston Township, the City of Kingston and the early settlement of the Province. However the identified resources are in a ruinous state with the outbuildings in a state of collapse. The state of all of these buildings means that it was unlikely that they could be rehabilitated and/or restored.

The Stage 1 and 2 Archaeological Assessment and Built Cultural Heritage reports along with their findings and recommendations were all accepted by the Ministry of Tourism, Culture and Sport.

7.4 Noise Study

Noise generated by the operation of the inverters and electrical substation has been cited as a potential concern by the MOE. Based on past experience operating solar farms, SunEdison has found this noise to be negligible. In order to meet the MOE requirements a modelling study was completed. Prior to commencement of these studies a field visit was conducted to map all potential receptors including: residences, campgrounds, schools, hospitals and long-term care facilities within 1.5 km of the site.

The purpose of the noise study was to determine what the sound levels at nearby residences would be if the project was built as proposed. This study was conducted in accordance with Appendix A of the publication of the Ministry of the Environment entitled, *Basic Comprehensive Certificates of Approval (Air) – User Guide*, dated April 2004 and subsequent amendments.

The results of this study shows that noise levels are below the 40 dBA standard specified by the REA Regulation for all potential receptors.

8. Conclusions

The SunE Westbrook Solar Farm is proposed in response to the Provincial Government's policy to increase the supply of renewable energy in the province. The project has a FIT contract for the purchase of electricity from the Ontario Power Authority. It is expected that the construction, operation maintenance, and subsequent decommissioning of the SunE Westbrook Solar Farm will not have significant negative effects on human and natural environments based on the proposed project layout and

design, construction practices, and operating procedures. The Project will provide an important electricity resource for Ontarians.

9. Contacts for Comments and Further Information

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