

NEWBORO 1 SOLAR

SunE Newboro 1 Solar Farm

Executive Summary



O c t o b e r 5 , 2 0 1 2

Table of Contents

1. Background	1
2. Project Developer	1
3. Project Location and Size	1
4. Project Equipment	1
4.1 Solar PV Technology	1
5. Approvals Process	2
6. REA Reporting	2
6.1 REA Project Schedule	3
7. REA Studies	3
7.1 Natural Heritage Studies	3
7.1.1 Studies Completed	3
7.1.2 General Findings	4
7.2 Water Bodies Study	5
7.2.1 Studies Completed	5
7.2.2 General Findings	5
7.3 Archaeological and Built Heritage	5
7.3.1 Consideration of Protected Properties and Heritage Resources	5
7.3.2 Consideration of Archaeological and Built Heritage Resources	6
7.4 Noise Study	7
8. Conclusions	7
9. Contacts for Comments and Further Information	7

1. Background

SunEdison Canada is proposing to construct a 10-Megawatt (MW) (AC) ground-mounted solar PV (photovoltaic) project near the villages of Newboro and Crosby in the Township of Rideau Lakes, 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 Newboro 1 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 is located on McCann Road, north of Crosby, within the Township of Rideau Lakes, Ontario. Figure 1 in Appendix A shows the study area. The area is generally bounded by:

- McCann Road along the north
- Narrows Lock Road (County Rd 14) along the west

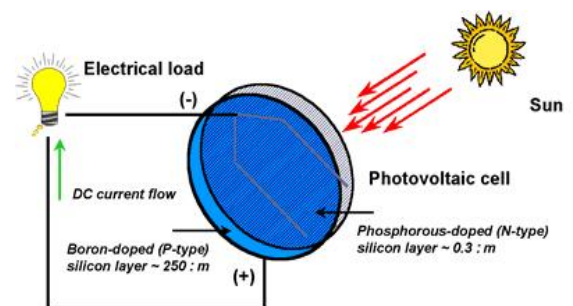
The proposed project will have a nameplate capacity of 10 MW (AC) which will be produced by approximately 40,000 solar panels. The project's electrical substation will also be located on site. The solar farm will be located on privately owned land. The project's electrical substation will also be located on site. One overhead electrical connection line would run south within the Narrows Lock Road right of way and then north-west within the County Road 42 right of way to connect to the existing Hydro One distribution line running east-west along County Road 42. The study area and site plan are shown in Appendix A.

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

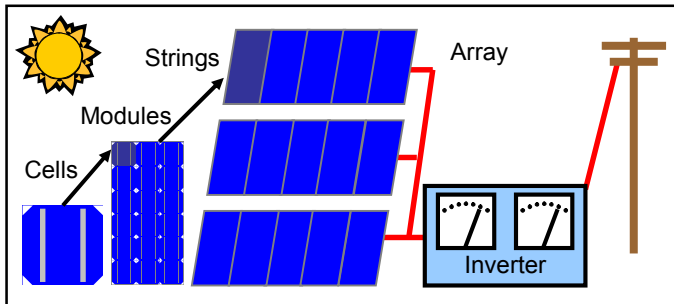
4. Project Equipment

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 Newboro 1 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 Newboro 1 Solar Farm REA documentation package.

6.1 REA Project Schedule

Initial Public Meeting:	September 27, 2011
Final Public Meeting:	July 11, 2012
Submission of the REA Application:	October 9, 2012
Commence Construction:	Summer 2013
Commercial Operation:	Late 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 of this report.

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 Rideau Valley and Cataraqui Region Conservation Authorities 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 Project Location is dominated by cultural meadow with cultural thickets and woodlots concentrated at the north end of the property. The property vegetation on and within 120 m of the Project Location is typically characterized by cultural thickets in the north and southeast portions of the property, and dry-fresh sugar maple deciduous forests along the north portion of the Project Location. The main woodland has been heavily logged which has influenced structure and composition, resulting in a patch species assemblage that is mostly dominated by young sugar maple.

The MNR was consulted for further information of natural features in the area and any known significant features.

The natural features (on or within 120 m of the project location) were evaluated for their significance (*Natural Heritage Assessment Evaluation of Significance Report*, Appendix C) and the following significant natural features were identified:

- Significant woodland which includes woodland raptor wintering area; and
- Woodland Amphibian breeding habitat.

The project has been designed to avoid natural features and wildlife habitat as much as possible and to minimize impacts on natural features. 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. In addition, bird, mammal, amphibian and reptile, fish and fish habitat may occur in the project area. There is potential for project activities to disturb these species through direct vehicle collisions or noise and visual disturbance. In order to prevent and/or minimize adverse effects on these features the mitigation measures proposed are shown in the table below and detailed in the *Natural Heritage Assessment Environmental Impact Study Report*, Appendix C.

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. In order to prevent and/or minimize adverse effects on these features the mitigation measures proposed are shown in Table 1 and detailed in the *Natural Heritage Assessment Environmental Impact Study Report*, Appendix C.

Table 1 – Proposed Mitigation Measures

Significant Natural Feature	Proposed Mitigation Measures
Significant Woodland Woodland Raptor wintering area	No vegetation clearing adjacent between early April and late June Ensure no loss of woodland outside of Project Location Standard BMPs for dust control, road construction and erosion control Site will be re-vegetated as an open meadow after construction Mowing of grass during operation will be delayed until mid-July
Woodland Amphibian breeding habitat	No vegetation clearing of pond areas (if present) between early April to late June

Significant Natural Feature	Proposed Mitigation Measures
	<p>Ensure no loss of woodland outside of Project Location</p> <p>Standard BMPs for dust control, road construction and erosion control</p> <p>Site will be re-vegetated as an open meadow after construction</p> <p>Mowing of grass during operation will be after construction</p> <p>Mowing of grass during operation will be delayed until mid-July</p>

The Natural Heritage Report was accepted as complete by the Ministry of Natural Resources in March 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 three portions: 1. a records review; 2. a field program and 3. an Environmental Impact Study. The water body studies noted that within 120m of the project location, the property has a water feature, an unnamed watercourse (man-made ditch) which runs southwest to County Road 14. Site investigations were undertaken from June to September 2011.

7.2.2 General Findings

The watercourse (minor agricultural drain) located in the centre of the Project Location extends southwest to County Rd 14. Greater than 120 m from the Project Location is an unnamed watercourse with an associated wetland which lies to the northeast of the Project Location.

The unnamed intermittent watercourse that lies in the western half of the project location is located approximately 15 m from the western boundary of the development footprint. The watercourse appears to be a man-made farm ditch dug to facilitate drainage on the adjacent fields. The watercourse does not provide fish habitat and is thought to have little ecological value. The watercourse is under the jurisdiction of the Cataraqui Region Conservation Authority and is regulated for its hydraulic function.

Based on the construction activities scheduled a 15 m vegetated buffer be should be maintained between the proposed development and the watercourse. The vegetated buffer will reduce the potential for increased erosion, sedimentation and turbidity due to exposed solid and generation of dust and particulate matter. Discussions were held with the Cataraqui Region Conservation Authority and they were satisfied that the 15 m setback and proposed mitigation measure was sufficient.

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

Archaeology

Construction of the project will result in the disturbance to land. As such, there is potential to disturb archaeological and heritage resources, should they exist on the site. A preliminary desktop (Stage 1) Archaeological study was completed to assess the potential for archaeological resources.

In addition, a property assessment (Stage 2) archaeological survey was completed on all lands to be disturbed which have potential for archaeological resources prior to construction in accordance with the Ministry of Tourism, Culture and Sport Guidelines. The Stage 1 background study found that the property exhibited potential for recovery of archaeological resources of cultural heritage value and concluded that a Stage 2 assessment was required. The Stage 2 was completed on the property and the characteristics of the property dictated that the Stage 2 survey be conducted both by pedestrian survey and test pit survey. The Stage 2 was conducted to document all archaeological resources on the property, to determine whether the property contains archaeological resources requiring further assessment and to recommend next steps. The Stage 2 report provided recommendations regarding additional mitigation efforts if necessary.

The results of the Stage 1 & 2 surveys are reported in (Appendix D). The Stage 2 property assessment resulted in the identification of 3 Euro-Canadian homesteads dating to the early to mid nineteenth century. The artifacts collected during the Stage 2 assessment indicated that these sites (designated as H1, H2 and H3) may represent sites of significant cultural heritage value and it was recommended that a Stage 3 assessment be undertaken.

A Stage 3 site-specific assessment was conducted in August-September 2012. Site H1 is located close to the proposed solar infrastructure. Stage 3 findings were used to determine the extent of the affected area surrounding H1 and the modifications needed for the solar panel layout. Based on the findings it was determined that the layout should be modified with a shift of some of the solar panels north on the site to provide a greater buffer between the infrastructure and the archaeological site. The Project Layout remained the same between the previous and revised layouts.

A letter of confirmation was received on April 13 from MTCS regarding the Newboro 4 solar farm project. The letter of confirmation agreed with the recommendations made in the Stage 1 and 2 Archaeological Assessments.

Should any archaeological resources be found during construction, work will be suspended within the immediate area of the find site and the MTCS will be contacted immediately. A licensed archaeologist will be contracted to assess the find, make recommendations on avoidance or removal should the find be determined to be significant.

Built Heritage

A cultural heritage resource assessment was conducted on the Newboro 1 solar farm. Based on project limitations and constraints mitigation options were refined for the project as follows:

1. Minimizing the visual impacts of the substation on four heritage features (CHL1, CH2, CHL3 and CHL 9) through the use of vegetative or wooden screening along the sides of the sub station visible from these resources.
2. Preparation of a landscape documentation report (prior to construction activities) to serve as final record of the resource and the project location in general.
3. Where feasible, existing fence rows and/or tree lines around the perimeter of the project location should be preserved.
4. Post-construction landscaping and rehabilitation should be undertaken in a manner similar to the character of the existing cultural heritage landscapes.

A letter of confirmation from the MTCS was received on July 6, 2012 that agreed with the recommendations in the Built Cultural Heritage Assessment.

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 Newboro 1 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 Newboro 1 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

Patricia Becker, MES
Project Manager
GENIVAR
600 Cochrane Drive, 5th Floor
Markham, ON, Canada L3R 5K3
Phone: 905-713-2837
Fax: 905-475-5994
Email: pat.becker@genivar.com

Simon Gill,
Manager, Product & Business Development
SunEdison Canada
595 Adelaide Street East, Suite 400
Toronto, ON, Canada M5A 1N8
Phone: 647-258-9082 Ext. 3512
Fax: 416-907-3995
Email: sgill@sunedison.com

