



ENERGY SAVINGS FOR BUSINESS

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Solar PV Checklist

March 17, 2021
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INTRODUCTION

This document is intended as a guide to support the submission of accurate and complete solar PV project applications. All applicants with solar PV measures should ensure the application meets the Eligibility Requirements set out in the Participant Terms and Conditions, Contractor Code of Conduct and Eligible Measures List. The applicant must submit the requested documentation and answer the questions contained within this document.

It is recommended that a solar PV modelling software be used to answer some of the questions requested in the application. Examples of software include, but are not limited to:

- *NREL's PV Watts*
- *RETScreen*
- *pvPlanner*
- *Solar Pro*
- *Helioscope*

MAJOR DEFICIENCIES IN APPLICATIONS

Please note that all applications must meet the eligibility requirements from the Participant Terms and Conditions, Contractor Code of Conduct, and the Eligible Measures List. As there is limited funding available for solar PV projects, the ESB program requires that **any applications submitted after 2 p.m. MT on March 17, 2021** do not contain major deficiencies (see list of major deficiencies below). Applications that are submitted with major deficiencies after this time will be rejected and will require resubmission after the identified deficiencies and any issues are resolved.

If an application is rejected, it will not maintain its place in the queue and will be treated as a new submission. To prepare and submit a new application for re-submission after rejection, it is recommended that you keep all the information you entered within a separate file so that you have it for easy reference.

If other issues are identified during the application review process that are not major deficiencies, and where confirmation is needed for compliance with Participant Terms and Conditions, Contractor Code of Conduct or the Eligible Measures List, then an Information Request will be submitted to the applicant. If the Information Request process does not clarify the eligibility or application requirements, then the application will be rejected.

A major deficiency is defined as a failure to provide a reasonably complete and comprehensive version of one or more of the following documents:

- A complete Form A with all the required information (upload in Step 4 of the Application Process)
- System Diagram/Site Layout Diagram (upload in Step 4 of the Application Process)
- Specification sheets for panels and inverters, indicating the specific model if multiple models are listed on the specification sheet (upload in Step 4 of the Application Process)

- Single Line Diagram (upload in Step 5 of Application Process)
- Cost quote/invoice which outlines equipment and materials, installation and labour and design and other costs as three separate sub-totals. If further detail is available on individual line items within the three sub-totals, it is recommended to provide this information. The three sub-totals from the cost quote/invoice must be aligned with the costs provided in the application. The cost quote/invoice must include Contractor Name, Applicant Name, Facility Address, Project Size in DC Power, Date, Panel Model Number, Number of Panels, Inverter Model Number and Number of Inverters. (upload in Step 5 of Application Process)

CALCULATING THE SOLAR YIELD AND COMPARING IT TO THE OPTIMAL SCENARIO

To calculate the proposed system's performance, three scenarios are considered:

Scenario 1: Application

Parameters provided in the application are used to generate the solar yield.

Scenario 2: Base Case for Solar Yield Calculation

Parameters provided in the application, with the exception of the modelled system losses, which are set to 20% for consistency. Used to calculate the project the total yield for eligibility confirmation.

Scenario 3: Optimal Case for Solar Yield Calculation

Parameters provided in the application are used to calculate the optimal solar yield for eligibility confirmation, with the exception of the following parameters that will be set as follows:

- Azimuth: 180°
- Tilt: Angle set at degree of latitude of location provided in application
- Modelled system losses: 20%

It is understood that other parameters will influence the optimal yield for a location; however these three parameters have been chosen for consistency and ease of calculation.

Scenario 2 ("Base Case for Solar Yield Calculation") will be compared to Scenario ("Optimal Case for Solar Yield Calculation"). Scenario 2 must be at least 75% of Scenario 3 to be eligible. If you need more information about the solar yield calculation, please refer to the solar PV webinar [video](#) on the ESB Program website.

GUIDANCE ON APPLICATIONS

The following sections provide guidance on solar PV applications, ensuring that they are complete, accurate and comprehensive.

APPLICATION TIP: If the system has multiple arrays or Site IDs, each array or Site ID can be submitted as its own measure.

The applicant and/or contractor will also need to provide the following information in Step 4 and Step 5 of the pre-project application submission, as further described in the tables below.

STEP 4 OF PRE-PROJECT APPLICATION

Field	What to Enter	How Data or Input Provided is Used
Quantity	Enter the number of solar PV systems being installed	<ul style="list-style-type: none"> • Calculate eligible incentive. • Post-project QA/QC.
Is it a retrofit or new construction?	<p>Enter retrofit if the project is being installed on an existing building or the solar PV project is providing power to existing equipment.</p> <p>Enter new construction if it is being installed on a new building or the solar PV project is providing power to new equipment.</p>	<ul style="list-style-type: none"> • Post-project QA/QC.
Status of the interconnection application	Select Not applied, Applied or Approved. In either case submit the complete Form A along with all the documents submitted to the wire service provider for the approval at Step 5 of the application submission.	<ul style="list-style-type: none"> • You will receive a conditional approval if “Applied” or “Not Applied” is selected. • Approval is required by the post-project submission deadline.
Interconnection Form A Application	<p>Upload both the interconnection application and the supporting documents including the single line diagram if all the documents can be combined.</p> <p>If they cannot be combined, upload the supporting documents in Step 5 (see below).</p>	<ul style="list-style-type: none"> • Confirmation that application has been submitted.

Field	What to Enter	How Data or Input Provided is Used
Latitude	Enter the values with decimal places.	<ul style="list-style-type: none"> • Used to confirm facility address/location. • Used in PV Watts modelling.
Longitude	Enter the negative value with decimal places.	<ul style="list-style-type: none"> • Used to confirm facility address/location. • Used in PV Watts modelling.
DC system size (in kW)	Enter the DC system size in kW considering the panels/modules.	<ul style="list-style-type: none"> • Incentive calculation. • Cross-referenced to Interconnection Application and Form. • Cross-referenced to panel/module specification sheets uploaded. • Used in PV Watts modelling.
Module type	Select either Standard, Premium or Thin Film.	<ul style="list-style-type: none"> • Post-project QA/QC. • Used in PV Watts modelling.
Array type	Select any one of the following: <ul style="list-style-type: none"> • Fixed – Open Rack • Fixed – Roof Mount • 1-Axis Tracking • 1-Axis Backtracking • 2-Axis Tracking 	<ul style="list-style-type: none"> • Post-project QA/QC. • Used in PV Watts modelling.
Modelled Total System Losses (%)	Account for all the possible system losses and enter value in percentage.	<ul style="list-style-type: none"> • Used in PV Watts modelling. • Evaluate if reasonable based on location and surroundings.
Tilt (deg)	Enter tilt of the panels/modules with respect to the ground.	<ul style="list-style-type: none"> • Used in PV Watts modelling. • Evaluate if reasonable based on location and surroundings.
Azimuth (deg)	Enter the azimuth.	<ul style="list-style-type: none"> • Used in PV Watts modelling. • Evaluate if reasonable based on location and surroundings.
System Diagram	Upload the site/panel/ module layout diagram.	<ul style="list-style-type: none"> • Used to check orientation of panels/modules. • Used to confirm number of panels/modules.
Retail Electricity Rate (\$/kWh)	Enter the average value you are using for your project payback calculations.	<ul style="list-style-type: none"> • Post-project QA/QC. • Used in PV Watts modelling.
January – December AC Energy (kWh)	Enter in the first year's values from your solar modelling analysis of typical	<ul style="list-style-type: none"> • Post-project QA/QC. • Used in PV Watts modelling.

Field	What to Enter	How Data or Input Provided is Used
	environmental, climate and operating conditions.	
Panel Specification Sheet	Upload the panel/ module specification sheet. Indicate/circle which specific panel/ module is being used for project.	<ul style="list-style-type: none"> • Post-project QA/QC. • Ascertain warranty information (if provided on specification sheet).
Inverter Specification Sheet	Upload the Inverter specification sheet. Indicate/circle which specific Inverter is being used for project.	<ul style="list-style-type: none"> • Post-project QA/QC. • Warranty information (if provided on specification sheet).
Application Comments	Enter in any additional information.	<ul style="list-style-type: none"> • Reviewer will read any additional information provided.
Equipment and Material Costs	Enter equipment and material costs as indicated on the invoice/quote.	<ul style="list-style-type: none"> • Calculate incentive cap. • Post-project QA/QC.
Labour Costs	Enter labour costs as indicated on the invoice/quote.	<ul style="list-style-type: none"> • Calculate incentive cap. • Post-project QA/QC.
Design Costs	Enter design costs as indicated on the invoice/quote.	<ul style="list-style-type: none"> • Calculate incentive cap. • Post-project QA/QC.

STEP 5 OF PRE-PROJECT APPLICATION

Document	What to Enter	How Data or Input Provided is Used
Cost Quote	Quote or invoice should be itemized to include quantity, brand, model numbers for equipment, applicant name, contractor name, facility address and date. Costs should be indicated separately for: <ul style="list-style-type: none"> • Equipment and Material • Labour • Design and Others • Taxes 	<ul style="list-style-type: none"> • Cross-reference against provided costs in application. • Calculate incentive cap. • Post-project QA/QC.
Warranty Documents	Showing compliance with the four warranty requirements <ul style="list-style-type: none"> • 20-year power performance • 10-year panel/ module • 10-year inverter • 1 year workmanship 	<ul style="list-style-type: none"> • Checking compliance with warranty requirements.
Single Line Diagram	Upload the Single Line Diagram that supports the Interconnection Application and Form A.	<ul style="list-style-type: none"> • Review Interconnection Agreement application and confirm application was supported with single line diagram.
Electricity Bill for Facility	Upload the electricity bill for the facility if the Site ID contained in the Form A does not show a rate class. <i>Does not apply to new construction facilities.</i>	<ul style="list-style-type: none"> • Ascertain rate class.

POST-PROJECT APPLICATION

Note that for the post-project application, you will be required to confirm that no changes were made from the pre-project application, unless an Application Change Approval Notice was issued by ERA.

In terms of documents required, you will need to provide evidence of the following:

- Interconnection Agreement Approval
- Electrical and Installation Permits
- Invoice for Project Costs
- Proof of Payment for Project Costs
- Conditions stated in the Notice of Pre Approval

Participants may be subject to a QA/QC check and may be asked for additional documentation or to facilitate a site visit.