Technical Standard and document checklist for approval of Solar PV Module for Mini Grid and Irrigation Projects

Application package:

1. Forwarding letter to ED and CEO of IDCOL mentioning model number, capacity i.e. ABC-85 (85Wp), details of the contact person, purpose i.e. mini-grid/irrigation.
2. Test report for 2 (two) samples of each model from Bangladesh University of Engineering and Technology (BUET) or United International University (UIU).
3. IEC 61215 certificate for crystalline modules and IEC 61646 for thin film modules.
4. IEC 61701 Ed 2.0: Salt mist corrosion testing of PV Modules.
5. IEC 61730 for safety equipment
6. ISO 14001:2004/2005 and OHSAS 18001:2007 certified from a certification body approved by International Accreditation Forum (IAF) or American International Accreditation Organization (AIAO).
7. Environmental clearance certificate from the Department of Environment.
8. Environmental and Health Safety (EHS) Assessment report/ISO 14001:2004[2005] and OHSAS 18001:2007 compliance report.
9. Data specification sheets for all models from the manufacturer.
10. Warranty certificate from the module manufacturer.
11. Agency agreement between the supplier and the manufacturer.
12. Audit report.
13. Company Profile mentioning years of operation, area of operation and status of sister concern organizations etc.

Application Guideline:

1. Model names of the PV modules must be identical and highlighted in all submitted documents.
2. Model names of the PV modules must be unique to avoid confusion with other applied models.
3. The panel supplier has to prove adequate response on proper implementation of EHS through documentation and physical arrangement. In case of inadequate response, they could be asked to submit EHS implementation report of six months period.

Test Report should include the following data at STC:

1. I-V and P-V characteristics
2. Output (Wp)
3. Open circuit voltage (Voc)
4. Short circuit Current (Isc)
5. Voltage at Maximum Power (Vmp)
6. Current at Maximum Power (Imp)
7. Efficiency (η%)
8. Fill Factor (FF)
9. Maximum System Voltage (V)

Technical standard for Photovoltaic Module (PV Module) for mini-grid and irrigation projects:

- ✓ The following are applicable standards for PV modules:
  - International Electrotechnical Committee (IEC) 61215:2005: Crystalline Silicon Terrestrial PV Modules Design Qualification and Type Approval
  - IEC 61646: Thin Film Silicon Terrestrial PV Modules Design Qualification and Type Approval
  - IEC 61701 Ed 2.0: Salt mist corrosion testing of PV Modules.
  - IEC 61730 for safety equipment.
- ✓ The photovoltaic module should have a peak power output of at least 250Wp.
- ✓ All modules must be product tested and certified from IEC accredited laboratories. IEC 61215 (Or IEC 61646, whichever applicable) and IEC 61730 are mandatory for PV modules. IEC 61701 will be applicable for PV module installation in coastal areas.
- ✓ Each module must be factory equipped IP65 junction box with terminal strip that allows safe and long lasting wiring connection to the module. Where applicable, protective diodes should be used to avoid the effect of partial shading. Factory test report of the PV module must be provided during supply of product
- ✓ Each module must have permanent labeling indicating at a minimum: Manufacturer, Model Number, Serial Number, Peak Watt Rating, Voltage and Current at peak power, Open Circuit Voltage, Short Circuit Current and Cell Efficiency of each module.
- ✓ Power tolerance must be positive for each of the PV modules.
- ✓ Module Efficiency (η%) should be minimum 15% at STC.
- ✓ Fill Factor (FF) should be more than 70%.
- ✓ Power tolerance must be positive

Warranty:

A. Ten (10) Year Limited PV Module Warranty

PV Modules(s) should be warranted to be free from the defects and/or failures specified below for a period not exceeding ten (10) years from the date of sale to the original customer:
1) Defects and /or failures due to manufacturing;
2) Defects and/or failures due to materials;
3) Cracking of the front glass surface due to foreign objects inside the glass; or
4) Non-conformity with specifications due to faulty manufacturing and/or inspection processes.
If the PV Module(s) fails to conform to this warranty, PV module(s) should be immediately replaced.

B. **Limited Power Output Warranty**

Any power loss is due solely to defects in materials or workmanship; IDCOL demands the warranty of the power output of each type of PV Modules(s) as follows:
IDCOL demands that if, (a) within the first ten (10) years from the date of sale to the Customer, the PV Modules(s) exhibits a power output of less than ninety percent (90%) of the original minimum rated power

specified at the time of sale, or (b) within twenty (20) years from the date of less than eighty percent (80%) of the original minimum rated power specified at the time of sale, manufacturer will repair, fix (by putting additional panel) or replace the PV Modules(s) at their own cost or refund the Purchase Price taking into account a yearly depreciation of five percent (5%) of the panel price. In case of the refund of the depreciated price of the panel, the panel will remain with the user and company will not take it from him/her. The period of power output warranty for these replaced modules(s) will be equal to the remaining warranty period of the originally supplied module(s).

Final test before installation:

A TSC approved solar panel should again be tested before installation.

1. A minimum of 10 PV panels must be tested in case of the total PV capacity of the proposed project is more than 10kWp by an individual supplier and the test results will be averaged.
2. If the PV capacity is less than or equal to 10kWp, 1 PV panel/kWp of total PV capacity should be tested.
3. In case of any deficiency between the test results and the rated power output of the PV panel:
   - The suppliers are required to provide additional PV panels to compensate the deficiency in the rated power output of the PV panels for the total PV capacity or;
   - In case the supplier is unable to provide additional PV panels due to constraints associated with system design & integration with other equipment, the deficiency in the power output might be balanced by deducting from the disbursement of the supplier. Cost per Wp of PV panels as submitted by the suppliers during the evaluation of quotations will be considered as the base of deduction.
4. Sampling will be done by IDCOL.