



विद्युत अभियांत्रिकी विभाग
DEPARTMENT OF ELECTRICAL ENGINEERING
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Enquiry number: **EE/SSKI/2015-2016/001**

Date: 4th August, 2015

Quotations from prospective vendors are invited by Electrical Engineering, IIT Kanpur for 5 kWp solar PV modules.

Note:

(i) The technical and financial bid should be submitted together in separately sealed envelopes.

(ii) The 5 kWp solar PV modules must have following minimum technical specifications.

1. Module Peak Power	Greater than or equal to 200 Wp
2. Rated Power	Not less than 2% of rated power
3. Protection	3 bypass diode protection
4. Modules Efficiency	Greater than or equal to 15%
5. Warranty	25 years with less than 1% decrease in power per annum.

Important Note:

1. In addition to the above the modules should conform to the general guidelines and specifications, warranties etc. as specified in Annexure-3 (copy attached) of MNRE letterNo.5/23/2009-P&C dated 16th Jun 2010.
2. Certified flash sheets giving important data/characteristics of each module will be provided.
3. Junction boxes of each panel should be IP65 compatible.
4. 10% randomly selected modules may be verified for its efficiency & power at reputed laboratory/Testing Center. If power is found less than 2% of its rated power, whole lot stands as 'Rejected' & have to be replaced on supplier's own cost.

The quotations must reach to us latest by 1st September 2015, 1700 hrs at the following address:

Professor S Sundar Kumar Iyer
Room No.: 305
Samtel Centre for Display Technologies
Indian Institute of Technology Kanpur
Kanpur - 208016

**MINIMAL TECHNICAL REQUIREMENTS / STANDARDS
FOR SPV SYSTEMS / PLANTS TO BE DEPLOYED DURING F.Y. 2012-2013
UNDER THE PROGRAMMES OF
MINISTRY OF NEW AND RENEWABLE ENERGY**

1. PV MODULES:

1.1 The PV modules must conform to the latest edition of any of the following IEC / equivalent BIS Standards for PV module design qualification and type approval:

Crystalline Silicon Terrestrial PV Modules	IEC 61215 / IS14286
Thin Film Terrestrial PV Modules	IEC 61646 / Equivalent IS (Under Dev.)

Concentrator PV Modules & Assemblies	IEC 62108
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1.2 In addition, the modules must conform to IEC 61730 Part 1- requirements for construction & Part 2 - requirements for testing, for safety qualification or Equivalent IS (Under Dev.)

1.3 PV modules to be used in a highly corrosive atmosphere (coastal areas, etc.) must qualify Salt Mist Corrosion Testing as per IEC 61701 / IS 61701.

1.4 IDENTIFICATION AND TRACEABILITY

Each PV module must use a RF identification tag (RFID), which must contain the following information:

- (i) Name of the manufacturer of PV Module
- (ii) Name of the Manufacturer of Solar cells
- (iii) Month and year of the manufacture (separately for solar cells and module)
- (iv) Country of origin (separately for solar cells and module)
- (v) I-V curve for the module
- (vi) Peak Wattage, I_m , V_m and FF for the module
- (vii) Unique Serial No and Model No of the module
- (viii) Date and year of obtaining IEC PV module qualification certificate
- (ix) Name of the test lab issuing IEC certificate
- (x) Other relevant information on traceability of solar cells and module as per ISO 9000 series.

Until March 2013, the RFID can be inside or outside the module laminate, but must be able to withstand harsh environmental conditions. **However from 1st April 2013 onwards; RFID shall be mandatorily placed inside the module laminate**

1.5 **VALIDITY :**

The validity of the existing Certificates/Reports in the old format/procedure shall be valid till March 2013 only. Manufactures are advised to get their samples tested as per the new format/procedure before 31st March 2013, whose validity shall be for five years.

1.6 **AUTHORIZED TESTING LABORATORIES/ CENTERS**

PV modules must qualify (enclose test reports/ certificate from IEC/NABL accredited laboratory) as per relevant IEC standard. Additionally the performance of PV modules at STC conditions must be tested and approved by one of the IEC / NABL Accredited Testing Laboratories including Solar Energy Centre. For small capacity PV modules upto 50Wp capacity STC performance as above will be sufficient. However, qualification certificate from IEC/NABL accredited laboratory as per relevant standard for any of the higher wattage regular module should be accompanied with the STC report/ certificate.

1.6.1 **Details of Test Labs are given in Annexure I.**

(Any other Test Lab that has set – up for testing and wants to get included may contact Director,MNRE)

1.6.2 **While applying for Testing , the Manufacturer has to give the following details:**

- *A copy of registration of the company particularly for the relevant product/ component/ PV system to be tested*
- *An adequate proof from the manufacturer, actually showing that they are manufacturing product by way production, testing and other facilities*
- *Certification as per JNNSM standards for other boughtout intems used in the system*

Without above proof test centers are advised not to accept the samples.

1.7 **WARRANTY**

PV modules used in solar power plants/ systems must be warranted for their output peak watt capacity, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years.

2. BALANCE OF SYSTEM (BOS) ITEMS/ COMPONENTS:

- 2.1 The BOS items / components of the SPV power plants/ systems deployed under the Mission must conform to the latest edition of IEC/ E quivalent BIS Standards/ MNRE specifications / as specified

below:

BOS Item / System	Applicable BIS /Equivalent IEC Standard Or MNRE Specifications	
	Standard Description	Standard Number
Solar PV Lighting Systems:	Solar PV Home Lighting System Solar PV street Lighting System Solar PV Lantern	As per MNRE latest Specifications dated 09.09.2011
Solar PV Systems (more than 100 Wp and up to 20 KWp Capacity only) : Charge Controller/MPPT units Power Conditioners/ Inverters**including MPPT and Protections	Environmental Testing Efficiency Measurements Environmental Testing	IEC 60068-2 (1,2,14,30) / Equivalent BIS Std. IEC 61683 / IS 61683 IEC 60068-2 (1, 2, 14, 30) / Equivalent BIS Std.
Storage Batteries	General Requirements & Methods of Testing Tubular Lead Acid / VRLA / GEL Capacity Test Charge/Discharge Efficiency Self-Discharge	As per relevant BIS Std.
Cables	General Test and Measuring Method PVC insulated cables for working voltage up to and including 1100 V and UV resistant for outdoor installation	IEC 60227 / IS 694 IEC 60502 / IS 1554 (Pt. I & II)

Switches/Circuit Breakers /Connectors	General Requirements Connectors –safety A.C. /D.C.	IEC 60947 part I,II, III / IS 60947 Part I,II,III EN 50521
Junction Boxes /Enclosures for Inverters/Charge Controllers/Luminaries	General Requirements	IP 54(for outdoor)/ IP 21(for indoor) as per IEC 529

**In case if the Charge controller is in-built in the inverter, no separate IEC 62093 test is required and must additionally conform to the relevant national/international Electrical Safety Standards wherever applicable

2.2 AUTHORIZED TESTING LABORATORIES/ CENTERS

Test certificates / reports for the BoS items/ components can be from any of the NABL/ IEC Accredited Testing Laboratories or MNRE approved test centers. The list of MNRE approved test centers will be reviewed and updated from time to time.

2.3 WARRANTY

The mechanical structures, electrical works including power conditioners/inverters/charge controllers/ maximum power point tracker units/distribution boards/digital meters/ switchgear/ storage batteries, etc. and overall workmanship of the SPV power plants/ systems must be warranted against any manufacturing/ design/ installation defects for a minimum period of 5 years.

Accredited Test centers for MNRE Off-Grid Programme

Lab/ Organizat ion	PV Module	Lighting Systems		Battery	Inverter >100 W		Charge Controller	
		as per MNRE Specificatio ns	Environment al		Efficiency	Environmental	protections	Environmental
SEC	Yes (IEC61215up to100W _p) NABL Accredited	Yes MNRE Accredited	Yes (Including IP) MNRE Accredited	Yes MNRE Accredited	Yes (upto 10KVA) MNRE Accredited	Yes (Including IP) MNRE Accredited	Yes MNRE Accredited	Yes (Including IP) MNRE Accredited
ERTL (east)	STC Test Facility MNRE Accredited	Yes NABL/ MNRE Accredited	Yes NABL/ MNRE Accredited	Yes Up to 1000AH	Yes NABL/ MNRE Accredited	Yes NABL/ MNRE Accredited	Yes NABL/ MNRE Accredited	Yes NABL/ MNRE Accredited
ETDC (B)	Yes (IEC61215)u nder ICEEE- CB, IEC 61701 (upto100W _p) NABL Accredited	Yes NABL/ MNRE Accredited	Yes NABL/ MNRE Accredited	Yes Up to 100 AH	Yes (up to 3KVA) NABL/ MNRE Accredited	Yes NABL/ MNRE Accredited	Yes NABL/ MNRE Accredited	Yes NABL/ MNRE Accredited
CPRI (B)	No	Yes NABL/ MNRE Accredited	Yes NABL/ MNRE Accredited	Yes Up to 500 AH	Yes (up to 10KVA) NABL/ MNRE Accredited	Yes NABL/ MNRE Accredited	Yes NABL/ MNRE Accredited	Yes NABL/ MNRE Accredited
ERTL (N)	No	Only Electronics & luminaire NABL	Yes NABL Accredited	No	Yes (up to 5KVA)	Yes NABL Accredited	Yes (up to 5KW)	Yes NABL Accredited

		Accredited			NABL Accredited		NABL Accredited	
UL (B)	Yes (IEC61215 IEC 61730 Pt.II and IEC 61701) upto400W _P NABL Accredited	Yes (except battery) NABL Accredited	Yes NABL Accredited	No	Yes (up to 6KVA) NABL Accredited	Yes NABL Accredited	Yes (up to 6KW) NABL Accredited	Yes NABL Accredited
TUV Rhineland	Yes (IEC61215 & 61730 Pt-II) upto400W _P NABL Accredited	NO	Yes NABL Accredited	No	Yes (up to 10KVA) NABL Accredited	Yes NABL Accredited	Yes (up to 10KW) NABL Accredited	Yes NABL Accredited
Inter Tek	No	Only Electronics & luminaire NABL Accredited	Yes NABL Accredited	No	Yes (up to 5KVA) NABL Accredited	Yes NABL Accredited	Yes (up to 5KW) NABL Accredited	Yes NABL Accredited

*Beyond 10KVA self certification by the manufactures is acceptable.