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Electrical Engineering Department
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18 Sep 2012.

Dr. RAGHUBIR SINGH ANAND
Principal Research Engineer

To,

All concerned

Subject: **5 KWp Off Grid Solar Photovoltaic Power Plant : Tender Notice**

With reference to the subject mentioned above, you are invited to submit the quotation in a sealed cover of following items for 5 KW Off-grid solar power plant in order to reach us before...**5PM, 4 Oct 2012..** in the proforma quotation enclosed herewith in the form of soft copy for your use. The soft copy of the model quotation can also be downloaded from our website placed at the following link http://web.iitk.ac.in/dord/rndforms/project_purchases.php.

1. Mono or Multi-crystalline Silicon Modules (preferably >200W)
2. Structure for Modules
3. Storage Battery (Low Maintenance), 96V, 600AH complete with accessories
4. Power Conditioning Unit, 5kW/5KVA, 96VDC, 240V AC, 50Hz, RS485 Connectivity.
5. Array Junction Box, Main Junction Box
6. AC Distribution Board, ACDB1-5K, 32 A. MCB, Voltmeter. Ammeter, Kwh meter and other BOS items as required for complete system.
7. Transport, Installation and commissioning.

- Important Note: 1. Modules, inverters, batteries and other items 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 16 Jun 2010.
2. Certified flash sheets giving important data/characteristics of each module and inverter will be provided.

Thanks.

(RS Anand)

Encls: Modal Quotation

Model Quotation for Imports for the use of vendor

Dated:

To
 Dr./Prof.
 Dept.
 Indian Institute of Technology, Kanpur

Sub : Quotation for supply of :
 Ref : Your enquiry letter no: & date:

Sir / Madam:

With reference to your enquiry letter on the subject mentioned above, the following quotation is hereby submitted for your consideration, in a sealed cover.

II Supplier Details: Agency / Vendor name: Local Agent:

1. Address :
2. Ph.No :
3. Mobile :
4. Email :
5. Bank A/c No :
6. Bank Name & Add. :
7. SWIFT/ IFSC Code :

III. Description & Costs of Material / Equipment:

Sl No.	Complete description / specification of items required	Model No.	No of Units	Unit Price	Total Amount
1	Default Specs:				
2	Optional Specs:				
3	Agency Commissions, if any				
4	Discounts, if any				
5	Shipment cost: <ul style="list-style-type: none"> • Ex-Work • Free on Board Value (FOB) • Cost-Insurance-Freight 				

	(CIF) <ul style="list-style-type: none"> • Cost & Freight (C&F) • Free Carrier Arrangement (FCA) <i>(Choose one of the above, as applicable)</i>				
6	Total Cost in INR /US\$ / other currency (specify):				

IV. Estimated Taxes :

	Taxes:	
	• Customs Duty as applicable	
	• Service Tax	
	• Other duties / taxes	
	Total Taxes:	

V. Freight charges (if not included in shipment costs mentioned above) :

	Item	Description
1	Freight Value	
2	Insurance Charges	
3	Packing and Forwarding Charges	
4	Documentation charges	
5	Total Insurance & Freight charges in foreign Currency	
6	Transportation Charges	
7	Other Charge, if any	
	Total Cost / quotation & Total Equal Value in Indian Rupees approx as on the date (III+IV+V)	

VI. Terms & Conditions:

	Item	Description
1	Guarantee/Warranty Yrs.	
2	AMC Value per annum	
3	Costs for additional warranty, if any	
4	No. of Preventive Maintenance Service visits per annum	
5	Validity period of quotation (Min. 60 days)	
6	Payment Terms: LC / TT upto US\$ 10K / DD upto US\$ 10K / CAD / Net 30 / Others <i>(Choose one of the above, as applicable)</i>	
7	Any other details	

VII: Other information of import:

Sl No.	Particulars/Specifications	Description
1	Country of Origin for Shipment	
2.	City of Origin for Shipment / Port of Shipment	
3.	Port of Landing	
4.	Delivery Period	
5.	Shipment Mode: (a) Air (b) Ship (c) Road (d) Rail (e) Others	
6.	Approximate Dimensions after packing	
	Length X Breadth X Height	
	Weight	

VIII) : Certifications & Enclosures for imports:

1. Technical Literature/Catalogue of equipment
2. Authorization letter from Principal Supplier in favour of Indian Agent attached
3. Certification from Agency including agency commission payable
4. Proprietary certificate, as applicable
5. Additional information, if any.

Signature of the authorized signatory

Date & Seal:

ANNEXURE-3

**MINIMAL TECHNICAL REQUIREMENTS/ STANDARDS FOR OFF-GRID/ STAND-ALONE SOLAR
PHOTOVOLTAIC (PV) POWER PLANTS/ SYSTEMS TO BE DEPLOYED UNDER THE NATIONAL SOLAR
MISSION**

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
Concentrator PV Modules & Assemblies	IEC 62108

1.2 In addition, the modules must conform to IEC 61730 Part 1- requirements for construction & Part 2 - requirements for testing, for safety qualification.

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.

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/ equivalent BIS Standards as specified below:**

BoS item/component	Applicable IEC/equivalent BIS Standard	
	Standard Description	Standard Number
Power Conditioners/Inverters*	Efficiency Measurements	IEC 61683
	Environmental Testing	IEC 60068 2 (6,21,27,30,75,78)
Charge controller/MPPT units*	Design Qualification	IEC 62093
	Environmental Testing	IEC 60068 2 (6,21,27,30,75,78)
Storage Batteries	General Requirements & Methods of Test Tubular Lead Acid	IEC 61427 IS 1651/IS 133369
Cables	General Test and Measuring Methods PVC insulated cables for working Voltages up to and including 1100 V-Do-, UV resistant for outdoor installation	IEC 60189 IS 694/ IS 1554 IS/IEC 69947
Switches/ Circuit Breakers/Connectors	General Requirements Connectors-safety	IS/IEC 60947 part I,II,III EN 50521
Junction Boxes/Enclosures	General Requirements	IP 65 (for outdoor)/IP 21 (for indoor) IEC 62208
SPV System Design	PV Stand-alone System design verification	IEC 62124
Installation Practices	Electrical installation of buildings Requirements for SPV power supply systems	IEC 60364-7-712

* Must additionally conform to the relevant national/international Electrical Safety Standards.

** Also refer Addendum No. 32/49/2010-11-PVSE dated 19.08.2010 appearing at the end of this document.

3. AUTHORIZED TESTING LABORATORIES/ CENTERS

3.1 The PV modules must be tested and approved by one of the IEC authorized test centers. Test certificates can be from any of the NABL/ BIS Accredited Testing / Calibration Laboratories. Qualification test certificate as per IEC standard, issued by the Solar Energy Centre for small capacity modules upto 37Wp capacity will also be valid.

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

4. WARRANTY

4.1 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.

4.2 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.

5. IDENTIFICATION AND TRACEABILITY

5.1 Each PV module used in any solar power project must use a RF identification tag (RFID), which must contain the following information. The RFID can be inside or outside the module laminate, but must be able to withstand harsh environmental conditions.

- (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.

**PRESENTLY AVAILABLE NATIONAL STANDARDS/ MNRE SPECIFICATIONS ON
SOLAR THERMAL COMPONENTS/ SYSTEMS**

A) Indian Standards

National Standards are brought out by Bureau of Indian Standards. The details of these Standards which contain minimum performance requirements along with test methods are as follows:

1. Solar Flat Plate Collectors

- a) IS 12933 (Part 1):2003, Solar flat plate collector -Specification, Part 1- Requirements.
- b) IS 12933 (Part 2):2003, Solar flat plate collector -Specification, Part 2 -Components.
- c) IS 12933 (Part 3):2003, Solar flat plate collector -Specification, Part 3 -Measuring instruments.
- d) IS 12933 (Part 5):2003, Solar flat plate collector -Specification, Part 5 -Test methods.

These Standards does not apply to concentrating & unglazed collectors and built-in-storage water heating systems.

2. Box-Type Solar Cookers

- a) IS 13429 (Part 1):2000, Solar cooker-Box type - Specification, Part 1 -Requirements.
- b) IS 13429 (Part 2):2000, Solar cooker- Box type - Specification, Part 2 -Components.
- c) IS 13429 (Part 3):2000, Solar cooker- Box type - Specification, Part 3 -Test methods.

B) MNRE Specifications

(Available on MNRE website www.mnre.gov.in)

- 1. Test Procedure for solar dish cookers
- 2. Test procedure for Thermo-siphon-type domestic solar Hot Water Systems

C) Testing Laboratories/ Centers

1 In order to make available quality product in the market, the Ministry works with Bureau of Indian Standards (BIS) and Quality Council of India. Presently, Indian Standards are available for solar flat plate collectors and box-type solar cookers and BIS implements a testing and certification programme which forms the basis of certification of these products by BIS.

2. For domestic size solar water heating systems based on thermo-siphon mode of operation, the Ministry has supported development of a test protocol with certain minimum performance requirements. For solar dish cookers, the Ministry has defined minimum specifications and has brought