

Guideline & Eligibility Criteria, Tender Evaluation criteria and Technical specification for 10 KW grid connected Solar photovoltaic power Plant at four Locations under UGVCL.

Date:

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1.0 CHECK LIST

To ensure that your offer submitted to UGVCL is complete in all respects, please go through the following checklist & tick mark for the enclosures attached with your offer:

Sr. No.	Description	Attached	Not Attached
1	Earnest Money Deposit in the prescribed form		
2	Tender Document Fee in the prescribed form		
3	Tender document duly signed & sealed on every page, as a confirmation of acceptance of the terms & conditions of the document.		
4	A copy VAT & CST Number, Permanent Account Number (PAN)		
5	Test certificate of PCU, Modules.		
6	Details of similar work done in last three years along with copies of the orders and certificates from the customers, their address phone/fax as per the Offer Evaluation Criteria and as per Annexure – I of the tender document		
7	Details of Technical staff available (Brief Biodata of key Personnel be given) as per Annexure – II of the tender document		
8	Name & address of dealers/ distributors/ service stations in Gujarat along with copy of agreements.		
9	Deviation, if any, from the specifications, terms & conditions etc. (Annexure – IV)		
10	Whether validity of your offer is confirmed as per the document.		

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2.0 GUIDELINES & ELIGIBILITY CRITERIA FOR BIDDERS

1. Tender are invited for Supply, Installation of 10 kW Grid connect Solar Photovoltaic Power Plant at different locations under UGVCL. The indicative quantities to be supplied, installed and commissioned are as mentioned below :

S.No.	Item	Indicative Quantity, Nos.
1	10 kW Grid connect Solar PV Power Plant at four different locations i.e. EMC office Gandhinagar ,VIP Guest House Sabarmati Ahmedabad, Palanpur Circle office ,Mehsana Division Office with 10 years CMC.	04

The quantity mentioned above is indicative only and it may vary depending on requirements of beneficiary, allocation of funds for the project etc. UGVCL, at its discretion, may increase/decrease the quantity.

2. Only those bidders of solar lighting systems, who manufacture solar PV modules and have adequate facilities for testing of solar PV system would be allowed to supply the systems under the scheme. The bidder should submit the list and pictures of the manufacturing and testing facilities and submit an undertaking that if the details provided by the bidders are in deviation with the provision of the scheme, it will call for disqualification. If considered necessary, a team of UGVCL official may visit the facilities of the bidders for verification. Companies which are engaged only in assembly of solar lighting systems with above mentioned bought out items will not be eligible for supply of systems under this scheme.
3. It is mandatory for system manufacturers to have valid test report for of Modules and Type Test certificate of respective model of PCU with similar or larger capacity from Government approved laboratory. No order will be placed on bidders, who do not possess valid test reports. Copy of test reports should be submitted by the bidders.
4. The bidder should be profit making company and have supplied solar photovoltaic systems of the values Rs. 2 Crore to any State Nodal Agencies/ Government Departments during the past three financial years and supplies against such work order should have completed satisfactorily as certified by the concerned State Nodal Agencies.
5. The programme implementation guidelines of the UGVCL/GEDA, as declared from time to time, for SPV programme shall be applicable and followed at all times.
6. The specification of grid connect SPV power plant, for which tenders are invited, is annexed.
7. Bidders should have well established network of service centers through out the state and should have adequately trained staff available at service stations for repair and maintenance of Solar PV Systems.
8. Bidder will ensure that necessary spares are always available with their service centers to provide necessary after sales service to the customers during the service period.
9. It is very critical to Install & Commission systems as per the order given by the agency **within Two months from the date of A/T**. To ascertain the manufacturing capabilities of each Bidder, no. of

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systems that could be supplied, installed and commissioned by the Bidder in the state, every Bidder is required to submit with their Technical offer, information about manufacturing capacity of their factory and no. of systems that could be supplied in the State.

10. The Bidder shall arrange to provide to each beneficiary, a SPV instruction manual. The Bidder shall also arrange to instruct each beneficiary about routine maintenance procedure.
11. Serial Number (identification mark) must be permanently marked on all major components of the SPV systems. Metallic number plates with serial numbers duly riveted or fixed with strong adhesive for non-metallic body, as approved by UGVCL, shall be fixed on charge controller of each lot.
12. The Bidder will offer Solar PV Systems for inspection at their works by UGVCL or its authorized quality inspection agency. Inspection can also be offered at one place in Gujarat (main distributor's place), where equivalent inspection facilities are available.

UGVCL reserves the right to inspect any number of SPV systems, any number of times at the addresses of the beneficiaries given by the Bidder.

13. IDENTIFICATION OF SITE

In consultation with UGVCL, a pre-feasibility may be made and may be submitted along with the tender. The complete work is to be executed in co-ordination with concern incharge.

14. UGVCL, at its discretion, may award work to more than one Bidder and will decide the quantity to be allocated to them. Decision of UGVCL in this matter, will be binding to all the Bidders.
15. In case of any type of misappropriations, cheating or intention of cheating, frauds, irregularities, malpractice, etc. UGVCL reserves the right to cancel the order without giving reasons thereof and forfeit the security deposit.
16. **Bidders are also required to quote rates inclusive of Comprehensive Maintenance Contact (CMC) for the period of ten years for the system.** The rates quoted should be inclusive of charges for providing routine maintenance services at the beneficiary's end to ensure smooth and satisfactory performance of the system. Replacement of any components of the system is included in the scope of work of CMC. As per the **Annexure-V** format quarterly report should be prepared and submitted to UGVCL after providing necessary services.
17. **The NOC/ permission with local utility and The Chief Electrical Inspector for connecting the SPV power plant in parallel to grid have to be obtained by the bidder.**
18. **Third Party Inspection shall be mandatory by the agency authorized by UGVCL.**

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3.0 TENDER EVALUATION CRITERIA

Offers of only those parties who are found qualifying based of following Tender Evaluation Criteria will be taken in to further consideration and prices of only those parties qualifying based of these criterion will be opened.

COMMERCIAL

- 1) Earnest Money Deposit and Tender Document Fee in the prescribed form should be submitted along with the tender.
- 2) The company should have a turnover of Rs. 2 Crore in past three years as per clause no. 4 of Chapter no.2.

TECHNICAL

- 1) Only those bidders of solar lighting systems, who manufacture solar PV modules and have adequate facilities for testing of solar PV system would be allowed to supply the systems under the scheme. The bidder should submit the list and pictures of the manufacturing and testing facilities and submit an undertaking that if the details provided by the bidders are in deviation with the provision of the scheme, it will call for disqualification. If considered necessary, a team of UGVCL official may visit the facilities of the bidders for verification. Companies which are engaged only in assembly of solar lighting systems with above mentioned bought out items will not be eligible for supply of systems under this scheme.
- 2) Test certificates submitted by the bidder should be in accordance with the clause no. **2,3,4,5 & 7 of Chapter No.2**, pertaining to Guidelines and eligibility criteria for bidders of the tender.
- 3) Offers received from only those parties having adequate infrastructure to manufacture, Market and provide after sales services in the state will be taken in to consideration and offers received from others will be summarily rejected. Documentary evidences in support of the same should be enclosed with the offer. UGVCL may visit manufacturing facilities to ascertain the claims made by the Bidder.
- 4) Details of similar work done in last three years along with copies of the orders and certificates from the user agencies should be submitted along with the Technical Offer as per Annexure – I of the Offer Document.
- 5) The party should have sufficient technically qualified and well-experienced manpower for Manufacturing, Marketing, Installation and after sales service of the systems. Brief biodata of the key personnel be enclosed with the offers as per Annexure-II of the Document.

GENERAL

- 1) As an acceptance of terms and conditions, the document duly signed and sealed on every page should be submitted. Offers not satisfying any of the above mentioned criteria will be liable for rejection.

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4.0 TECHNICAL SPECIFICATIONS

GRID CONNECT SOLAR POWER GENERATING SYSTEM

I DEFINITION

The Grid Connect Solar Power Generating System consists of mainly three components viz. the solar photovoltaic (SPV) array, module mounting structure and the power conditioning unit (PCU)/ inverter. The SPV array converts the solar energy into DC electrical energy. The module mounting structure holds the modules in required position and the DC electrical energy is converted to AC power by the PCU, which is connected to the power grid. The AC power output of the inverter is fed to the AC distribution board through metering panel and isolation panel. The 415 V AC output-3Ø of the system can be utilized or as an option it could be stepped up to the required voltage level and after synchronizing with the grid, can be exported to the grid.

II PV MODULE (S)

- (i) The PV module bidder should have IEC 61215-2nd Edition and IEC 61730-2 qualification certification for PV modules. Copy to be provided with tender.
- (ii) The PV module(s) shall contain crystalline silicon solar cells.
- (iii) The power output of the module (s) under STC should be a minimum of 10,000 W. Modules of minimum 150 W output each or above output should be used. Photo / electrical conversion efficiency of SPV module shall be greater than 13.5%.
- (iv) All materials used shall have a proven history of reliable and stable operation in external applications. It shall perform satisfactorily in relative humidity up to 100% with temperatures between -10 Deg C and +85 Deg C and with stand gust up to 200km/h from back side of the panel. The terminal box on the module should have a provision for opening for replacing the cable, if required.
- (v) A strip containing the following details should be laminated inside the module so as to be clearly visible from the front side.
 - a. Name of the Supplier or distinctive Logo
 - b. Model or Type No.
 - c. Serial No.
 - d. Year of make.

III EARTHING AND SURGE PROTECTIONS

- (i) The array structure of the PV modules shall be grounded properly using adequate numbers of earthing pits. All metal casing/ shielding of the plant shall be thoroughly grounded to ensure safety of the power plant.
- (ii) The SPV power plant shall be provided with lightning & over voltage protection. The source of over voltage can be lightning, atmosphere disturbance etc.

IV MECHANICAL COMPONENTS

- (i) Metallic frame structure of galvanized steel with stands to be fixed on the roof of the building to hold the SPV module (s) one feet above roof level. The frame structure should have provision to adjust its angle of inclination to the horizontal between 0 and 45, so that it can be installed at the

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specified tilt angle i.e. inclined at 25 degree to horizontal facing due south. All hardware, nuts, bolts should be cadmium passivated.

V OTHER FEATURES

- (i) The PV module (s) will be warranted for a minimum period of 10 years from the date of supply and the solar PV power plant will be warranted for a period of **ten** years from the date of supply.
- (ii) An Operation, Instruction and Maintenance Manual in English and the local language (Gujarati) should be provided with the system.

The following minimum details must be provided in the Manual

- (a) About Photovoltaics
- (b) About solar PV system – its components and expected performance.
- (c) About PV module
- (d) Clear instructions about mounting of PV module (s)
- (e) About electronics
- (f) DO's and DONT's
- (g) Clear instructions on regular maintenance and trouble shooting of solar power plant.
- (h) Name and address of the person or service center to be contacted in case of failure or complaint.

VI The details of the **Power Conditioning Unit** are as given below:

PCU rating (NOMINAL)	10 kVA / 10 KW, 415V VAC, grid interactive output
Purpose	The power conditioner unit shall convert DC produced by SPV array and adjust the voltage & frequency levels to suit the Grid.
Grid supervision	All three phases shall be supervised with respect to rise / fall in programmable threshold values of frequency & the power section of the plant. The plant shall get disconnected / connected from the grid in case of a grid fault / after normal grid conditions have resumed. The grid supervision must comply with VDEW or other relevant/equivalent regulations.
Type & technology	IGBT based. Utilize a circuit topology and components suitable for meeting the specifications.
Output voltage on AC side	415 +10%, - 15% V AC A dedicated isolation transformer housed in the PCU enclosure shall be supplied to match the PCU output voltage to the utility grid voltage.
Output voltage	415 V ,50 Hz AC
Output Frequency	50 + 1.5Hz, - 3.5 Hz
DC system voltage	The electrical safety of the array installation is of the utmost importance. Array electrical configuration shall be in such a way that, the MPPT shall operate with maximum efficiency, between the low and high temperature of the site.
Maximal Current ripple	5% PP
Power Factor	0.95 inductive to 0.95 capacitive

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Ambient room temperature	5 to 55 deg C
Housing Cabinet	<p>a) PCU is housed in suitable switch cabinet, with min IP 21 degree of Ingress Protection.</p> <p>b) Weatherproof, rodents & insect proof</p> <p>c) Components and circuit boards mounted inside the enclosures clearly identified with appropriate permanent designations, which shall also serve to identify the items on the supplied drawings.</p> <p>d) All doors, covers, panels and cable exists shall be gasketed or otherwise designed to limit the entry of dust and moisture. All doors shall be equipped with locks. All openings shall be provided with grills or screens with openings no larger than 0.95 cm (about 3x8 inch).</p>

Other important features

<p>Electrical safety Protections</p> <p>a) General</p>	<p>The PCU shall include appropriate self protective and self diagnostic feature to protect itself and the PV array from damage in the event of PCU component failure or from parameters beyond the PCU's safe operating range due to internal or external causes. The self-protective features shall not allow signals from the PCU front panel to cause the PCU to be operated in a manner which may be unsafe or damaging. Faults due to malfunctioning within the PCU, including commutation failure, shall be cleared by the PCU protective devices and not by the existing site utility grid service circuit breaker.</p>
b) Over/under voltage	<p>a) Mains (Grid) over-under voltage and frequency protection.</p> <p>b) Over voltage protection against atmospheric lightning</p> <p>c) Protection against voltage fluctuations in the grid itself and internal faults in the power conditioner, operational errors and switching transients.</p>
c) Fool Proof Protection	<p>Against ISLANDING. Note : MOV type surge arrestors on AC and DC terminals for over voltage protection from lightning-induced surges</p>
d) Accidental open circuit	<p>Full protection against accidental open circuit and reverse polarity at the input.</p>
e) Internal Faults	<p>Inbuilt protection for internal faults including excess temperature, commutation failure, overload and cooling fan failure is obligatory</p>
f) Galvanic Isolation	<p>Galvanic isolation is provided to avoid any DC component being injected into the grid and the potential for AC components appearing at the array.</p>

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g) Earth Fault Supervision	An integrated earth fault detection device is provided to detect eventual earth fault on DC side and shall send message to the supervisory system
h) Disconnection & Islanding	Disconnection of the PV generator in the event of loss of the main grid supply is achieved by in built protection within the power conditioner. This may be achieved through rate of change of current, phase angle, unbalanced voltages, or reactive load variants.
i) Automatic reconnection after the Grid failure is resorted.	<p>Operation outside the limits of power quality as described in technical data sheet shall cause the power conditioner to disconnect the grid. Additional parameters requiring automatic disconnection are:</p> <ul style="list-style-type: none"> • Neutral voltage displacement • Over current • Earth fault & • Reverse power <p>In each of the above cases, tripping time shall be less than 0.5 seconds. Response time in case of grid failure due to switch off or failure based shutdown should be well within 60 seconds.</p>
Array Tracking	PCU has facility to reconnect the Inverter automatically to the grid following restoration of grid, subsequent to grid failure condition.
Array Ground fault	Included authentic tracking of the solar array's maximum power operation voltage (MPPT)
Operator interface	Provided
Fault conditions	LCD and keypad operator interface, Menu driven.
Control Logic Failure detection	Automatic fault conditions reset for all parameters like voltage, frequency and /or black out.
Parameter access	via watch dog timers.
DC-AC conversion efficiency	All parameters accessible through an industry standard communication link.
DC isolation	93% for output ranging from 20% to full load Idling current at no load shall not exceed 2% of the full load current.
Parallel operation with Grid	Provided at the output by means of a suitable isolating transformer
Unbalanced output load	Provided & capable of interrupting line-to-line fault currents and line to ground fault currents.
	PCU is able to withstand an unbalanced output load to the extent of 30%.

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Shut down / Standby mode	<p>Shut down / standby mode with its contact open under the following conditions before attempting an automatic restart after an appropriate time delay; in sufficient solar power output.</p> <p>a) Insufficient solar power input : When the power available from the PV array is insufficient to supply the losses of the PCU, the PCU shall go to a standby/shutdown mode. The PCU control shall prevent excessive cycling during rightly shut down or extended periods of insufficient solar radiation.</p> <p>b) Utility -Grid over or under voltage : The PCU shall restart after an over or under voltage shutdown when the utility grid voltage has returned to within limits for a minimum of two minutes.</p> <p>c) Utility-Grid over or under frequency_ : The PCU shall restart after an over or under frequency shutdown when the utility grid voltage has returned to the within limits for minimum of two minutes.</p>
PCU generated harmonics	Shall not exceed a total harmonic current distortion of 5%, a single frequency current distortion of 3%, and single frequency current distortion of 1%, when the first through the fiftieth integer harmonics of 50Hz are considered.
Circuit separation	High voltage & power circuits separated from low voltage & control circuits.
Internal wiring	Standard Cu wiring, with flame resistant insulation .
Cabling practice	<p>a) Cables :PVC Cu cables as per relevant international Standards)</p> <p>b) Cable connections : suitable terminations</p> <p>c) PVC channel with covers to house the cables.</p>
High voltage test	PCU with stand high voltage test of 2000 Vrms between either the input or the output terminals and the cabinet (chassis).
EMI (Electromagnetic interface)	PCU shall not produce EMI which cause malfunctioning of electronic & electrical instruments including communication equipments which are located within the facility in which the PCU is housed.
Display on front panel & indicators	<p>a) instantaneous PCU ac power output and the DC voltage current and power input</p> <p>b) Accuracy of display : 3% of full scale factor or better</p> <p>c) Display visible from outside the PCU enclosure.</p> <p>d) Operational status of the PCU, alarms, trouble indicators and AC and DC disconnect switch positions shall also be communicated by appropriate messages or indicator lights on the front cover of the PCU enclosure.</p>
Emergency OFF	Emergency OFF button is located at an appropriate position on the unit
Grounding	PCU includes ground lugs for equipment and PV array groundings. The DC circuit ground is a solid single point ground

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	connection.
Exposed surfaces	Exposed surfaces of ferrous parts are thoroughly cleaned, primed, and painted and suitably protected to survive a nominal 30 years design life of the unit.
Factory Testing	<p>a) Tested to demonstrate operation of its control system and the ability to be automatically synchronized and connected in parallel with a utility service, prior to its shipment.</p> <p>b) Operation of all controls, protective and instrumentation circuits demonstrated by direct test if feasible or by simulation operation conditions for all parameters that can not be directly tested.</p> <p>c) Demonstration of utility service interface protection circuits and functions, including calibration and functional trip tests of faults and isolation protection equipment.</p> <p>d) Operation of start up , disconnect and shutdown controls also to be tested and demonstrated, stable operation of the PCU and response to control signals shall also be tested and demonstrated.</p> <p>e) Factory testing include measurement of phase currents, efficiencies, harmonic content and power factor. All tests shall be performed 25, 50, 75 and 100% of the rated nominal power.</p> <p>f) Factory test report (FTR) : Should be supplied with the unit after all tests. The FTR shall include detailed description of all parameters tested qualified and warranted.</p>
Operating Modes	<p>a) Night or sleep mode : where the Inverter is almost completely turned off, with just the timer and control system still in operation, losses < 2 W per 5 kW</p> <p>b) Standby mode: where the control system continuously monitors the output of the solar generator until pre-set value is exceeded (typically 10 W).</p> <p>Operational of MPP tracking mode: the control system continuously adjust the voltage of the generator to optimize the power available. The power conditioner shall automatically re-enter standby mode input power reduces below the standby mode threshold. Front panel display providing the status of the PCU, including AC power output & DC current voltage and power input, and unit fault indication.</p>
Codes & Standards	<p>The quality of equipment supplied shall be controlled to meet the guidelines for engineering design included in the standards and codes listed in the relevant ISI and other standards, such as :</p> <p>a) IEEE 928: Recommended Criteria for terrestrial PV power systems.</p> <p>b) IEEE 929 Recommended practice for utility interface of residential and intermediate PV systems.</p> <p>c) IEEE 519 Guide for harmonic control and reactive</p>

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	<p>compensation of Static Power Controllers.</p> <p>d) National Electrical NFPA 70-1990 (USA) or equipment national standard.</p> <p>e) National Electrical Safety Code ANSI C2 (USA) or equipment national standard.</p>
Inverter / Array Size ratio	<p>The ratio of the Inverter continuous power rating and the array peak power rating shall be between 80 to 90% or any other value found suitable. This is because better overall annual yield can be obtained by allowing the Inverter to operate for longer periods closer to optimal efficiency. Inverter efficiency should exceed 90% except when operating at less than 10% of maximum output.</p>
MPPT	<p>Maximum power point tracker is integrated in the power conditioner unit to maximize energy drawn from the array. The MPPT shall be micro processor based to minimize power losses. The MPPT shall have provision (manual setting) for constant voltage operation.</p>
Metering	<p>a) PV array energy production: Meter to log the actual amount of AC energy generated / consumed by the PV system shall have to be provided.</p> <p>b) Solar irradiance : An integrating pyranometer (Class II or better) to be provided, with the sensor mounted in the plane of the array. Readout shall be integrated with data logging,</p>
Data Logging System	<p>a) All major parameters available on the digital bus and logging facility for energy auditing through the internal microprocessor and can be read on the digital front panel at any time the current values, previous values for up to a month and the average values. The following parameters shall be accessible via the operating interface display :</p> <p>AC voltage AC output current Output power DC input voltage DC input current Time active Time disabled Time Idle temperatures (C) Converter status Protective function limits (VIZ-AC over voltage, AC under voltage, Over frequency, under frequency, ground fault, PV starting voltage, PV stopping voltage, over voltage delay, under voltage delay over frequency, ground fault delay, PV starting delay, PV stopping delay.</p>

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CABLES & ACCESSORIES

All the cables which shall be supplied shall be conforming to IS 1554 / 694 Part 1 of 1988 & shall be of 650 V/ 1.1 kV grade as per requirement. Only PVC copper cables shall be used. The size of the cables between array interconnections, array to junction boxes, junction boxes to PCU etc shall be so selected to keep the voltage drop and losses to the minimum.

CONTROL ROOM

The required control room shall be constructed at additional cost if required.

SPARE PARTS

One set of essential spares for the PCU shall be provided and made available at the plant.

DOCUMENTATION

Two sets of installation manual / user manual shall be supplied along with the each power plant. The manual shall include complete system details such as array lay out, schematic of the system, inverter details, working principle etc. Step by step maintenance and trouble shooting procedures shall be given in the manuals.

BILL OF MATERIAL

The bidder should provide the bill of material for 10 kW Grid connect SPV power plant mentioning the quantity of each of the item consisting in the system, along with the offer.

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Appendix I

FORMAT FOR WARRANTY CARD TO BE SUPPLIED WITH EACH SOLAR PV SYSTEM

1. Name & Address of
The Bidder/Bidder of the System
2. Name & Address of Purchasing Agency
3. Date of supply of the system
4. Details of PV Module (s) supplied in the
System Make (Name of the Bidder)
Model
Serial No(s)
Wattage of the PV Module (s) under STC
Warranty valid up to
5. Details of Battery: Not Applicable
System Make (Name of the Bidder)
Model
Batch/Serial No(s)
Rated V & AH capacity at C/20 or C/10 rate at 20 C
Warranty valid up to
6. Details of Electronics & other BOS items.
System Make (Name of the Bidder)
Model
Serial No(s)
Warranty valid up to
7. Designation & Address of the person to be
Contacted for claiming Warranty obligations.

(Signature)
Name & Designation
Name & Address of the Bidder/bidder
(SEAL)

Place & Date:

(During the warranty period State Agencies/users reserves the right to cross check the performance of the systems with the minimum performance levels specified in the specifications).

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Annexure - A

5.0 MANUFACTURING CAPACITY
(to be completely filled by the tenderer)

Name of the Bidder	
Address of the Manufacturing Facility	

Sr. No.	Item	Manufacturing capacity of SPV modules per month	No. of systems committed to be supplied, installed and commissioned in the State before June 30, 2010
1	10 kW grid connect Solar PV power plants with 10 years CMC.		

**Signature of the Authorised Signatory and
Seal of the company:**

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Annexure – I

6.0 Details of similar work experience in last three years
(to be completely filled by the tenderer)

Sr. No.	Name of the Company with full address, phone, fax and name of contact person	Work Description	Ref. & date of the order	Work Order Value	Details of order & its configuration

- Copies of MAJOR Work orders along with Work completion certificates should be attached with this information.
 - If necessary, separate sheet may be used to submit the information.

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Annexure – II

7.0 Details of Technical staff available with the company for execution of work
(to be completely filled by the tenderer)

Sr. No.	Name	Qualification	Additional Certification, if any	Total Experience, no. of years	Remarks

- Copies of Resumes and appropriate certifications should be attached with this information.
 - If necessary, separate sheet may be used to submit the information.

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Annexure - IV

DEVIATION SHEET

Any deviations offered from the terms and conditions of the Offer should be clearly specified below in this sheet. If there are no deviations offered, it should be clearly mentioned on this page.

Deviation offered to Chapter No, Clause No. of the tender document	Deviation offered

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Annexure - V

QUARTERLY MAINTENANCE & SERVICING REPORT

1. DETAILS OF SOLAR PHOTOVOLTAIC SYSTEM INSTALLED

1. Supplied by :
2. Date of installation :
3. Servicing period: From to

2. USER PROFILE

1. Name and address of User:

3. TECHNICAL DETAILS

1. Module Capacity, make and serial number :

4. CHECK OF THE PRODUCT

1. Correct inclination and orientation of SPV panel :
2. Cleaning of dust from SPV panel :
3. Interconnection of modules, charge controller, battery etc.:
4. Fuse of charge controller, PCU:
5. PCU Reading of power generation:

5. DIFFICULTIES IN OPERATION/ PROBLEM FACED BY USER:

6. DIAGNOSIS DETAILS/ REPAIR ACTION:

7. DATE ON WHICH SYSTEM WAS LAST ATTENDED:

8. REMARKS:

**User Name & Signature
Date:**

**Technician's Name & Signature
(with rubber stamp)**

Date:

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Annexure – VI

List of Plant and Machinery
(to be completely filled by the tenderer)

For manufacturing of Solar PV panels.

S. No.	Name of equipment	Date of purchase	Date of calibration	Utility

Date:

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