



# TENDER DOCUMENT FOR DESIGN, SUPPLY, INSTALLATION & COMMISSIONING OF 30 kWp ON-GRID SOLAR (SPV) POWER PLANT

## **E-TENDER NOTICE No.:**

CIPET/CSTS/IMP/ADMIN/E-TENDER/02/HSP/2022-23 dated 24.02.2023.

**LAST DATE FOR SUBMISSION OF ONLINE BID: 13.02.2023 at 5:30 PM**

**Central Institute of Petrochemicals Engineering & Technology; (Formerly Central  
Institute of Plastics Engineering & Technology); CIPET: CSTS IMPHAL  
Takyelpat Industrial Estate, Imphal West Manipur -795 001  
Department of Chemicals & Petrochemicals;  
Ministry of Chemicals & Fertilizers, Govt. of India  
e-mail: cipetim@gmail.com/imphal@cipet.govt.in,**

**Website: [www.cipet.gov.in](http://www.cipet.gov.in)**

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# **PART-I**

# **GENERAL DETAILS**

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## Notice Inviting E-Tender

Central Institute of Petrochemicals Engineering & Technology; (Formerly Central Institute of Plastics Engineering & Technology); CIPET: CSTS Imphal, invites E-Tender in two Bid systems (Technical and Financial) from Resourceful and reliable bidders for **Design, Supply, Installation and Commissioning of 30 KWp On-Grid Solar (SPV) Power Plant** at CIPET: CSTS Imphal.

SI. No.	E-Tender No. & Date	Name of the Item / Work	Estimated Value in Rupees	EMD in Rupees	Completion Time	Tender Fees in Rupees	Last Date & Time of online Bid submission
1	CIPET/CST S/IMP/ADMIN/E-TENDER/02/HSP/2022-23 dated 24.01.2023	Design, Supply, Installation and Commissioning Of 30 kWp On-Grid Solar PV Power Plant.	20,00,000.00	70,000.00	60 Days from the date of issue of Purchase Order / Work Order	3,000.00 Non-Refundable	13.02.2023 up to 5.30 P.M

Interested and eligible bidders may view and download the detailed tender documents from CIPET's E-Tender portal [www.tenderwizard.com/CIPET](http://www.tenderwizard.com/CIPET) or [www.cipet.gov.in](http://www.cipet.gov.in)

All Bids must be submitted through the online portal [www.tenderwizard.com/CIPET](http://www.tenderwizard.com/CIPET) on or before 13.02.2023 up to 5.30 P.M. The Tender Fee and EMD will only be accepted in the form of Demand Draft drawn on any Indian Nationalized Bank favouring “**CIPET Imphal**” payable at **Imphal** and shall be submitted at CIPET Imphal as specified on or before closing period of Tender in separate sealed cover superscripted with “TENDER FOR CIPET IMPHAL - DESIGN, SUPPLY, INSTALLATION AND COMMISSIONING OF 30 KWP HYBRID SOLAR PV POWER PLANT at the RCC roof of Boys Hostel of CIPET:CSTS Imphal .”, failing which bids will be summarily rejected. Additionally, a soft copy / photocopy of the Tender Fee and EMD Demand Draft shall also be uploaded along with the Technical Bid to be submitted online.

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**Salient information about the E Tender:**

**1. Mode of submission:** ONLINE. No offline Tenders will be accepted.

**2. Availability of Tender Documents:** All Bid formats (Technical & Financial) will be available ONLINE at CIPET's E – Tender portal [www.tenderwizard.com/CIPET](http://www.tenderwizard.com/CIPET) or [www.cipet.gov.in](http://www.cipet.gov.in). The registered vendors can download the Bids from these websites.

**3. Who can participate for this E-Tender:** The registered vendors of CIPET through [www.tenderwizard.com/CIPET](http://www.tenderwizard.com/CIPET) can only participate in this tender process.

**4. How to register by a vendor:**

(a) The prospective bidders have to register with CIPET through the E-tender portal of CIPET at [www.tenderwizard.com/CIPET](http://www.tenderwizard.com/CIPET) by making an Online Payment (As per applicable rate inclusive GST) to M/S. KEONICS LTD. On completion of the registration process, the bidders will be provided user ID and password. After receipt of User ID & Password, Bidders can log on at our E-Tender portal for downloading & uploading tender documents.

(b) Tender Documents Fees, applicable for all (Non – refundable) of Rs. 3,000/- is Payable to CIPET Imphal in the form of Demand Draft from any Nationalize Bank not drawn before the Date of Releasing of NIT.

(c) Processing Fees (As applicable as per norms of Keonics) Payable Online separately to M/S. KEONICS LTD.

**5. Is there any device requirement for participation in E-Tender:** Yes, Bidders should have valid Class-III Digital Signature Certificate (DSC) device for participating in e-Tender. For integrity of data and its authenticity / non-repudiation of electronic records and to be compliant with IT Act 2000, it is necessary for each user to have a Digital Certificate (DC), also referred to as Digital Signature Certificate (DSC) of Class-III issued by a Certifying Authority (CA) licensed by Controller of Certifying Authorities (CCA).

**6. Contact details for e-Tender related issue:**

Name of the Service Provider: KEONICS		
Contact Person	Telephone / E-mail	Remarks:
Telephone no. / Mobile no. (Helpdesk) (i) Abhijit Sinha :-	i) 9864779970 / 8800115946 {between 9:00 am to 6:00 pm}	For Vendor registration / any other issue regarding e- Tender Process, please contact:
E-mail id	i) <a href="mailto:abhijit.s@etenderwizard.com">abhijit.s@etenderwizard.com</a>	KEONICS as per the details given in the previous Columns.

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7. Bidders are hereby advised that all the documents to be submitted online are kept scanned to PDF & JPEG format in a separate folder on their computers before starting online submission. The schedule of rate (Excel Format) may be downloaded and rates may be filled appropriately in this format only. This file may also be saved in a separate folder on your computer.
  8. While uploading / submitting the documents, it should be ensured that the file name should be the name of the document itself.
  9. All pages of Tender documents with Addenda / Corrigenda (if any) must be signed with proper official stamp and date by the Bidders / or authorized power of attorney holders at the lower right hand corner.
  10. Micro & Small Enterprises as defined in MSME or firms registered with Central Public Organization or concerned Ministry or Department are exempted from payment of EMD (As per GFR 2017 Rule no. 170.). Necessary certificate as proof in such case has to be submitted mandatorily to claim such exemption. However in case of such bidder being selected as L1, the security deposit have to be submitted prior to release of work order / purchase order.
  11. Bidders are advised to visit CIPET's E – Tender portal regularly for any Addenda / Corrigenda (if any) with regard to the E – Tender, for which no separate paper advertisement will not be published.
  12. **Last date of online submission of Tender bid: 13.02.2023 up to 05:30 PM.**
  13. EMD and Tender Fee must be in approved mode only and shall be duly Signed & Sealed in separate cover as described above in person / by speed post on or before last date of submission at CIPET CSTS Imphal. Non-receipt of the same is liable for rejection of the Tender.
  14. **Date & Time of Technical Bid Opening:** 14.02.2023 at 10.30 A.M.
  15. **Date & Time of Financial Bid Opening:** Technically qualified bidders will be intimated about the date & time after technical bid evaluation through the E-Tender portal.
  16. **Venue for Opening Bids:** CIPET CSTS Imphal
  17. **Eligibility Criteria:**
    - (a) Age of the Firm shall be more than 03 Years as on 31.01.2022 as on last day of bid submission.
    - (b) Tenderer should have completed at least similar Job(s) during the last 03 (Three) financial years as mentioned below:
      - i. One similar completed Job costing not less than the amount equal to 80% of the estimated cost.

OR

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ii. Two similar completed Job each of value not less than 50% of the estimated cost.

OR

iii. Three similar completed Job each of value not less than 40% of the estimated cost.

CIPET reserves the absolute right to accept / reject any or all bids at any stage of the tender process without assigning any reason whatsoever.

Joint Director & Head  
CIPET:CSTS Imphal

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## SUBMISSION OF TENDER

FROM:- .....

To,

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.....

**Subject: - Offer in response to Tender Notice No. ....**

Sir,

we hereby submit our offer in full compliance with terms & conditions of the attached tender in Part-I (Technical Bid) & Part-II (Financial Bid).

**(Signature of tenderer with Seal)**

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## PARTICULARS OF TENDER

1	Tender Notice No.	CIPET/CSTS/IMP/ADMIN/E-TENDER/02/HSP/2022-23 dated 24.02.2023
2	Particulars of the work	Design, Supply, Installation and Commissioning of 30 KWp On-Grid Solar PV Power Plant at CIPET:CSTS Imphal
3	Estimated project cost	Rs. 20,00,000.00 (Rupees Twenty Lacs Only)
4	Period of contract	60 Days from the date of issue of Purchase Order / Work Order
5	Cost of tender document	Rs. 3,000.00 (Rupees Three Thousand Only)
6	Last date/ time of submission	13.02.2023 up to 05:30 PM
7	Amount of Earnest money (3.5% of the project value)	Rs. 70,000.00 (Rupees Seventy Thousand Only)
8	Validity of offer for acceptance	6(Six) Month from the date of opening of the Technical bid
9	Date and Time of opening of Technical Bid	14.02.2023, at 10:30 AM
10	Place of opening of tender	CIPET: CSTS Imphal



**GENERAL PARTICULARS OF TENDERER**

<b>SI</b>	<b>Particulars</b>	<b>Details</b>
1	Name of Tenderer/Firm	
2	Postal Address	
3	E-mail	
4	Telephone No.	
5	Name, designation & contact number of the representative of the tenderer to whom all references shall be made.	
6	Nature of the firm (Individual/ Partnership/Consortium/ Pvt. Ltd/Public Ltd. Co. /Public Sector etc.) Attach attested copy of Registration & Partnership deed/ Memorandum of Association.	
7	Amount and particulars of the earnest money deposited.	
8	Annual Turnover for last three years (Attach balance sheets from CA in this regard)	
9	Name and address of the Indian/foreign collaboration if any.	
10	GSTN Registration no.(Copies of Registration Certificates to be enclosed)	
11	Has the tenderer/firm ever been debarred by any institution for undertaking any work?	
12	Any other information attached by the tenderer (Details and Annexure / page no. where its enclosed)	

Tenderers are requested to give their full particulars and legal and financial status.

**(Signature of tenderer with Seal)**

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## DECLARATION BY THE TENDERER

I/We.....(Hereinafter referred to as Tenderer) being desirous of tendering for the work, under this tender and having fully understood the nature of the work and having carefully noted all the terms and conditions, specifications etc. as mentioned in the tender document do hereby declare that-

1. The tenderer is fully aware of all the requirements of the tender document and agrees with all provisions of the tender document and accepts all risks, responsibilities and obligations directly or indirectly connected with the performance of the tender.
2. The tenderer is fully aware of all the relevant information for proper execution of the proposed work, with respect to the proposed place of works/ site, its local environment, approach road and connectivity etc. and is well acquainted with actual and other prevailing working conditions, availability of required materials and labour etc. at site.
3. The tenderer is capable of executing and completing the work as required in the tender and is financially solvent and sound to execute the tendered work. The tenderer is sufficiently experienced and competent to perform the contract to the satisfaction of Institution, IIT Imphal and AICTE. The tenderer gives the assurance to execute the tendered work as per specifications, terms and conditions of the tender on award of work.
4. The tenderer has no collusion with other tenderers, any employee of or with any other person or firm in the preparation of the tender.
5. The tenderer has not been influenced by any statement or promises by The Institution or IIT Imphal or AICTE or any of its employees but only by the tender document.
6. The tenderer is familiar with all general and special laws, acts, ordinances, rules and regulations of the Municipal, District, State and Central Government that may affect the work, its performance or personnel employed therein.
7. The tenderer has never been debarred from similar type of work by any Government undertaking/Department. (An undertaking on Stamp paper in this regard shall be submitted)
8. The tenderer accepts that the earnest money may be absolutely forfeited by The Institution if the tenderer fails to sign the contract or to undertake the work within stipulated time.
9. This offer shall remain valid for acceptance for 6 (Six) months from the proposed date of opening of the Technical Bid.
10. All the information and the statements submitted with the tender are true.

**(Signature of tenderer with Seal)**

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# **PART-2**

## **INSTRUCTIONS TO TENDERERS**

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## SECTION 1

### INTRODUCTION

#### 1. ELIGIBILITY OF TENDERERS

The tenderer shall provide sufficient documentary evidences to satisfy the following conditions of the tenderer:

- a) Is an indigenous manufacturer/supplier of the Solar P.V. Module or Battery or PCU and experienced contractor in the field of Solar P.V. power plants.
- b) Has established a quality assurance system and organization designed to achieve high levels of equipment reliability in manufacturing of the Solar Systems.
- c) Has adequate financial stability and status to meet the financial obligations pursuant to the scope of work. (The firm must have an annual turnover of minimum 50 Lacs during the last two years.)
- d) Has experience of Design, manufacturing, supply, installation and maintenance/after sale services in the field of off-Grid / On-Grid / Hybrid Solar PV Plants of more than 50 kW capacities and Supply, Installation of Solar Street Lights in the last three years. The details must be submitted in the Performa given in the Technical Bid section of tender document with proof.
- e) Has adequate field service setup to provide good quality after sales services including necessary repair and maintenance.
- f) Has valid Test Certificate of the Solar PV Power Plant as specified and required in the Technical- Bid of this tender document.

The above stated requirements are compulsory to be fulfilled by the tenderer and Tendering Authority may also ask for any additional information as may be deemed necessary in public interest.

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## SECTION 2

### THE TENDER DOCUMENT

#### 2.1 CONTENT OF TENDER DOCUMENT

**2.1.1** The tender procedure and contract terms are prescribed in the tender document. In addition to the invitation of tender, the tender document includes the various other documents as given.

**2.1.2** The tenderer is expected to examine all instructions, terms and conditions, specifications, forms and formats etc. as mentioned / enclosed in the tender document. Failure to furnish all information required in the tender document or submission of a tender not substantially responsive to the tender document in every respect will be at the tenderer's risk and is likely to result in out-right rejection of the tender.

#### 2.2 INFORMATION REQUIRED WITH THE PROPOSAL

**2.2.1** The tender must clearly indicate the name of the manufacturer, the types and model & make of each principal item of equipment proposed to be supplied. The tender may also contain details of specifications and other comprehensive descriptive materials in support of technical specifications.

**2.2.2** The above information may be provided by the tenderer in the form of separate sheets, specifications, catalogues etc.

**2.2.3** Any tender not containing sufficient descriptive material to describe the proposed equipment may be treated as incomplete and hence may be rejected. Such descriptive materials and specifications submitted by the tenderer will be retained by Tendering Authority. Any deviations from these will not be permitted during the execution of the contract, without specific written permission of Tendering Authority.

#### 2.3 CLARIFICATION OF TENDER DOCUMENT

**2.3.1** Any prospective tenderer requiring any clarification on the tender document regarding various provisions/ requirements/ preparation/ submission of the tender, may contact Tendering Authority in writing by letter / email within one week (7 days) from the date of publication/up-loading of tender at Website. Queries received later shall not be entertained.

**2.3.2** Verbal clarifications and information shall not be entertained in any way.

#### 2.4 AMENDMENTS IN TENDER DOCUMENT

**2.4.1** At any time prior to the due date for submission of the tender or even prior to the opening of the financial bid, Tendering Authority may for any reason, whether at its own initiative or as a result of a

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request for clarification/ suggestion by a prospective tenderer, amend the tender document by issuing a notice.

**2.4.2** The amendments will be notified on the website at least 3 days before the proposed date of submission of the tender. Tendering Authority will bear no responsibility or liability arising out of non-receipt of the information in time or otherwise. If any amendment is required to be notified within 3 days of the proposed date of submission of the tender, the last date of submission shall be extended for a suitable period of time.

## **SECTION 3**

### **PREPARATION OF TENDER**

#### **3.1 LANGUAGE OF TENDER AND MEASURE**

The tender prepared by the tenderer along with all the related documents shall be in English. Any printed literature furnished by the tenderer may be in another language so long as it is accompanied by an English translation of its pertinent passages. Unit measurements shall be in accordance with the International System (SI). All correspondence between the tenderer and Tendering Authority shall also be in English.

#### **3.2 EARNEST AND SECURITY MONEY**

**3.2.1** The tenderer shall furnish earnest money as mentioned in the 'Particulars of Tender' in the prescribed format from any nationalized bank as a part of his tender. Tenders without EMD shall be rejected by the Tendering Authority as being non-responsive.

**3.2.2** The earnest money shall be forfeited in case of any of the following reasons: -

- a) If a tenderer withdraws his tender during the specified period of validity of offer.
- b) If the successful tenderer fails to sign the contract agreement within stipulated period.

**3.2.3** The earnest money of the successful tenderer will be adjusted against the security money to be deposited. At this time, the tenderer shall have to deposit interest free security money amounting to 10% of the contract value in the form of FDR/CDR/DD from any nationalized bank pledged in favour of CIPET Imphal.

**3.2.4** Tendering Authority may also decide to split the work between other tenderers who choose to execute the work on the lowest rates received in the tender. The earnest money of such selected tenderers shall also be adjusted against the security money to be deposited after signing the agreement and submission of 10% security money by them. After receiving the consent to work on the lowest rates, the earnest money of such tenderers shall be forfeited if they fail to sign the contract agreement within stipulated period.

**3.2.5** The earnest money of all other tenderers who do not accept the lowest rates shall be released after receiving their written intimation regarding not being interested.

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### **3.3 PERIOD OF VALIDITY OF TENDER**

**3.3.1** Validity of the offer should be Six (06) months from the proposed date of opening of the technical bid. Tenders without this validity will be rejected.

**3.3.2** In exceptional circumstances, Tendering Authority may solicit the consent of the tenderers to an extension of the period of validity of offer. The request and the response thereof shall be made in writing.

### **3.4 FORMATS AND SIGNING OF TENDER**

**3.4.1** The tender must contain the name and places of business of the firm/person/persons participating in the tender and must be signed and sealed by the tenderer with his usual signature. The name and designation of all persons signing the tender document should be written below each signature. Tenders by a partnership firm must be furnished with the full name of all partners with a copy of partnership deed.

**3.4.2** The original copy of the tender should be typed or written in indelible ink and must be signed with the legal name of the corporation/ company by the President/ Managing Director/ Secretary of the firm or a person duly authorized to bid. In case of an authorized person, the letter of authorization by written power-of-attorney should be enclosed with the technical bid of the tender. The person or persons signing the tender shall initial all pages of the tender document.

**3.4.3** The tender shall contain no interlink actions, erasers or overwriting except as necessary to correct the errors made by the tenderer in the preparation of tender. The person or persons signing the tender shall also sign at all such corrections.

### **3.5 PRICE AND CURRENCIES**

The tenderer shall submit his rates in Indian Rupees (INR) only, on the format for Financial Bid attached to this tender document. The rates should include all applicable taxes, duties & surcharges.

## **SECTION 4**

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## SUBMISSION OF TENDER

### 4.1 GENERAL INFORMATION

**4.1.1** The Tender document shall be submitted in 2 (Two) parts.

PART A: Technical Bid

PART B: Financial Bid

The Tenderer must furnish the Technical Bid along with all required documents in hard or spiral binding only. All the enclosures shall be duly listed giving page numbers. In the event of non-compliance of this instruction, the Tendering Authority reserves the right to cancel such tender.

**4.1.2** The tender must be complete in all technical and commercial aspects and should contain requisite certificates, in the tender document.

**4.1.3** The complete tender document issued by the Tendering Authority or downloaded from the website should be submitted /uploaded by the tenderer after furnishing all the required information on relevant pages. Each page of the tender document should be signed & stamped. Tenders with any type of change or modification in any of the terms/ conditions of this document shall be rejected. If necessary, additional papers may be attached by the tenderer to furnish/ submit the required information.

**4.1.4** Any term/condition proposed by the tenderer in his technical bid which is not in accordance with the terms and conditions of the tender document or any financial conditions, payment terms, rebates etc. mentioned in the financial bid shall be considered as a conditional tender and will make the tender invalid.

**4.1.5** Tender cost, Earnest money & other certificate in original shall be received at least one hour before opening time of bid to the Tendering Authority.

### 4.2 DEADLINE FOR SUBMISSION OF TENDER

Tenders must be received by the Tendering Authority till the date & time of submission as specified in the tender document.



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## TENDER OPENING AND EVALUATION

### 5.1 OPENING OF TENDER

The procedure of opening of the tender shall be as under:

**5.1.1** Tender shall be opened by Tendering Authority's representatives at the time and date mentioned in the '**Particulars of Tender**', in the presence of tenderers who choose to be present. The financial and technical suitability of offers will be examined by the Tendering Authority in detail. If required, clarifications regarding the suitability of the offers will be obtained.

**5.1.2** "Financial bid" of only those tenderers shall be considered whose technical bid is found responsive, suitable and in accordance with the various requirements of the tender.

### 5.2 CLARIFICATIONS REGARDING THE SUBMITTED TENDERS

**5.2.1** During the process of evaluation of the tender, the Tendering Authority may at its discretion ask the tenderer for a clarification of his tender. The request for clarification and the response shall be in writing.

**5.2.2** Any query regarding any clarification required by Tendering Authority on the information submitted by the tenderer, must be replied by the tenderer within the following time schedule.

- a) Email query should be replied by email within 2 days.
- b) Query by hard copy should be replied within 7 days.

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## AWARD OF CONTRACT

### **6.1 EVALUATION CRITERION**

The whole work shall be on Turnkey basis. The tender shall be finalized on the basis of both the Technical Bid and Price Bid offered by the tenderer.

### **6.2 NOTIFICATION OF AWARD**

Prior to the expiry of validity period of offer, Tendering Authority will notify the successful tenderer that his tender has been accepted.

### **6.3 AWARD OF WORK CONTRACT**

Before placement of supply orders, an agreement shall be signed between Tendering Authority and the successful tenderer. Complete work shall ordinarily be awarded to the lowest tenderer only if Their Technical Bid scores satisfactorily. The denial of the lowest bidder to undertake the whole work shall be treated as breach of contract and the Tendering Authority may forfeit the EMD/ Security amount submitted by him.

### **6.4 RIGHT TO VARY QUANTITIES**

Tendering Authority may increase or decrease the quantity mentioned in the tender notice at the time of award of contract and to split the work among various tenderers without any change in price or other terms and conditions & without assigning any reason thereof.

### **6.5 RIGHT TO ACCEPT/REJECT ANY OR ALL TENDERS**

Tendering Authority reserves all the rights to reject any or all the tenders, accept any tender in total or in part.

### **6.6 EXPENSES OF AGREEMENT**

The respective suppliers shall pay all the expenses of stamp duties and other requirements for signing the agreement with Tendering Authority.

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# **PART-3**

## **GENERAL CONDITIONS OF CONTRACT**

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## GENERAL CONDITIONS OF CONTRACT

### 1. DEFINITIONS

In the deed of contract unless the context otherwise requires:-

**1.1 “Tendering Authority”** shall mean **“CIPET CSTS Imphal”** and shall also include its successors in interest and assignees. The **‘Contractor’** shall mean the Firm / Person (whose tender has been accepted by Tendering Authority) and shall include his legal representatives, successor in interest and assignees.

**1.2** The agreement shall be for Supply, erection, testing and commissioning of 30 KW Hybrid Solar Power Plant (With battery bank)

**1.3** The empanelment shall be for a period of one year from the date of signing of the agreement. However, the validity of rates may further be extended to a specified period of time on the same terms & conditions on the mutual consent of both the parties.

### 2. COMPLETION PERIOD

**2.1** Under this agreement, The FDR/CR/TDR/ bank guarantee equivalent to 10% of the work order value, payable in favour of **“CIPET Imphal” payable at Imphal** shall have to be submitted by the contractor at the time of placement of work order.

**2.2** The total work assigned to the contractor through a work order shall have to be completed within 60 days from the date of work order. The work shall have to be completed within time and shall be binding on the contractor. In case of any urgency, the contractor may be asked to complete the work even earlier and the contractor will be bound to fulfil the requirements.

**2.3** In case the contractor fails to execute the said work or related obligations within stipulated time, Tendering Authority will be at liberty to get the work executed from the open market at the risk and cost of the contractor, without calling any tender and without any notice to the contractor. Any additional cost incurred by Tendering Authority during such execution of the work shall be recovered from the contractor.

**2.4** If the cost of executing the work as aforesaid shall exceed the balance payments due to the contractor and the contractor fails to make good the ‘additional cost’, Tendering Authority may recover it from the contractor's pending claims against any work in Tendering Authority or in any other lawful manner. All risks & responsibilities related to the execution of the said work and fulfilment of related obligations directly or indirectly connected with the performance of the contract shall be the sole responsibility of the contractor.

**2.5** The calculation of aforesaid ‘additional cost’ will be finalized by the Tendering Authority at its sole discretion. The contractor shall have no right to challenge the mode or amount relating to

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calculation at any forum. For completion of the work through any other agency, in case some changes are required in terms and conditions of the contract; the contractor shall not have any right to challenge the decision of the Tendering Authority.

### **3. LIQUIDATED DAMAGES**

If the contractor fails to perform the work within the time periods specified in the work orders or within the extended time period if any, Tendering Authority shall without prejudice to its other remedies under the contract, deduct from the contract price as liquidated damage, a sum equivalent to 1% of the price of the un-performed work/ services for each week of delay until actual completion of work, up to a maximum deduction of 10%. Once the maximum is reached, the Tendering Authority may consider termination of the contract.

### **4. PERFORMANCE SECURITY**

The amount of the earnest money (FDR/CDR/TDR) against 10% performance security amount deposited at the time of placement of work order shall be forfeited in case of breach of any term or condition by the contractor. If required, the other balance payments may also be forfeited, depending on the liabilities on the part of the contractor.

### **5. FORCE MAJEURE**

**5.1** Notwithstanding the provisions of clauses contained in this deed; the contractor shall not be liable for forfeiture of its performance security, liquidated damages, termination for default, if he is unable to fulfil his obligation under this deed due to force majeure circumstances.

**5.2** For the purpose of this clause, "Force majeure" means an event beyond the control of the contractor and not involving the contractor's fault or negligence and not foreseeable, either in its sovereign or contractual capacity. Such events may include but are not restricted to Acts of God, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes etc. Whether a "Force majeure" situation exists or not, shall be decided by the Tendering Authority & his decision shall be final and binding on the contractor and all other concerned.

**5.3** If a force majeure situation arises, the contractor shall notify Tendering Authority in writing promptly (at the most within 10 days from the date such situation arises). After examining the cases, the Tendering Authority shall decide and grant suitable addition time for the completion of the work.

**5.4** For other justified cases also, not covered under force majeure conditions, the Tendering Authority may consider the request of the contractor and additional time for completion of work may be granted.

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## **6. QUALITY, WARRANTY / GUARANTEE AND ANNUAL MAINTENANCE**

**6.1** The contractor shall warrant the Solar PV Power Plant as per applicable standards of quality. Anything to be furnished shall be new, free from all defects and faults in material and workmanship. The manufacture shall be in accordance with the specified technical parameters and should be of the highest grade and consistent with established and generally accepted standards for material. It shall be in full conformity with the drawing or samples if any and shall operate properly if operable.

**6.2** After erection of the Solar PV Power Plant at site, the contractor shall ensure satisfactory performance of the equipment for a period of time as specified in the scope of work.

**6.3** The contractor shall rectify defects developed in the Systems within warranty/operation/maintenance period promptly. In case the contractor does not rectify the defects within 7 days of the receipt of complaint, the Tendering Authority may restore the System in working condition on contractor's expenses.

**6.4** Frequent and unjustified delays in rectifying defects may lead to cancellation of the contract, recovery of losses and imposing of additional penalty. In such circumstances Tendering Authority shall have the full liberty to recover the losses/penalty from the contractor pending claims, EMD/performance security deposit or in other law full manner. The amount of losses/penalty shall be decided by the Tendering Authority and will be binding on the contractor.

## **7. STANDARDS**

The goods supplied and works executed under this contract shall conform to the standards mentioned in the technical specification and where no applicable standard is mentioned, the latest version of Indian Standard Institution or Bureau of Indian Specification shall be applicable.

## **8. INSPECTION AND TESTS**

**8.1** Tendering Authority or its duly authorized representatives shall have the right to inspect and /or to test the goods to confirm their quality according to the contract and shall have access to the contractor's works premises and the power to inspect and examine the materials and workmanship of the various components of Solar PV Power Plant at all reasonable times during their manufacture.

**8.2** The contractor shall inform the Tendering Authority through a written notice regarding any material being ready for testing at least 7 days in advance. The conditions of contract and/or the technical specifications shall specify what inspections and tests shall be conducted by Tendering Authority. All the arrangements of necessary equipment and expenses for such tests shall be on the contractor's account excluding the expenses of the inspector.

**8.3** Tendering Authority's Inspector, unless the witnessing of the tests is virtually waived off, will inspect and attend such test within 10 days from the date on which the equipment is notified as being ready for test /inspection.

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**8.4** Tendering Authority shall within 7 days, give written notice to the contractor, about any objection regarding the quality of the system. The contractor shall either make the necessary modifications to remove the cause of such objection or shall clarify the objections in writing if modifications are not necessary to comply with the contract.

**8.5** After satisfactory testing of the systems during inspection, the Tendering Authority's Inspector shall issue a dispatch clearance for the supply of material at site.

**8.6** The inspection by Tendering Authority and issue of dispatch instruction there on shall in no way limit the liabilities and responsibilities of the contractor in respect of the agreed and specified quality. Nothing in clause 8 shall in any way relieve the contractor from any warranty or other obligations under this contract.

**8.7** In Case any time the system is not found in accordance with the required technical specifications, the work order(s) Shall be cancelled and all the payments made by Tendering Authority to the contractor shall be recovered. Such contractors shall also be blacklisted from participating in any tender in the Tendering Authority in future. MNRE and other State Nodal Agencies of MNRE shall also be informed for the necessary action against such contractors.

## **9. SPARE PARTS**

The contractor shall make arrangements to maintain sufficient stock of essential spares and consumable spare parts to ensure proper maintenance of the system promptly.

## **10. PACKING FORWARDING**

**10.1** Contractors, wherever applicable shall properly pack and crate all materials in such a manner as to protect them from deterioration and damage during transportation. The contractor shall be responsible for all damage due to improper packing.

**10.2** The contractor shall inform the Tendering Authority regarding the probable date of each shipment of materials for his works.

## **11. TRANSPORTATION**

The contractor is required to deliver the goods at various locations as defined in the scope of work.

## **12. DEMURRAGE WHARFAGE, ETC**

All demurrage, wharfage and other expenses incurred due to delayed clearance of the material or any other reason shall be on the account of the contractor.

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### **13. INSURANCE**

**13.1** The goods supplied under the contract shall be fully insured against loss or damage incidental to manufacture or acquisition; transportation and the expenses shall be borne by the contractor.

**13.2** The contractor shall arrange security & storage of their materials to avoid any theft or losses during execution of work. Tendering Authority will, in no case, shall be responsible for providing any security/storage for the materials & equipment lying at site during execution of work. Under the contract contractor shall be responsible for any loss or damage until the systems/ supplies are taken over.

### **14. LIABILITY FOR ACCIDENTS AND DAMAGES**

During the Warranty, Operation & maintenance period, the contractor shall assume all responsibilities for direct damages covering all types of accident, injury or property damage caused by manufacturing defects or faulty installation on the systems.

### **15. DUTIES AND TAXES**

The rates/ prices mentioned in the price-schedule include all applicable taxes, duties & surcharges. No additional payments shall be made by Tendering Authority on this account.

### **16. PATENT RIGHT AND ROYALTIES**

The contractor shall indemnify Tendering Authority against all third-party claims of infringement of patent, royalties, trademark or industrial design rights arising from use of the goods supplied/ installed by the contractor or any part thereof.

### **17. RIGHT TO VARY QUANTITIES**

Tendering Authority reserves all the rights to increase or decrease the quantity of goods mentioned in the contract, at the time of placement of orders without any change in price or other terms and conditions.

### **18. LOCAL CONDITIONS**

**18.1** It will be imperative on contractors to have full information of all local conditions and factors which may have any effect on the execution of the works. The contractor shall be



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deemed to have collected all the relevant information regarding the proposed place of works/ site, its local environment, approach road and connectivity etc. and be well acquainted with actual working and other prevailing conditions.

**18.2** If required, the contractor should pre-visit the site before starting the work. Tendering Authority shall not entertain any request of contractors for clarifications related to such local conditions and shall bear no responsibility in this regard.

## **19. TOOLS & TACKLES**

The contractor shall provide all necessary tools & tackles for proper execution of work and operation/ maintenance of systems after installation. Tendering Authority shall in no way, be responsible for supply of any tools & tackles.

## **20. TERMINATION FOR DEFAULT**

Tendering Authority without prejudice to any other remedy for breach of contract, by written notice of default sent to the contractor, may terminate the contract in whole or in part:

**20.1** If the contractor fails to deliver the Services within the allocated time period(s).

**20.2** If the contractor fails to perform any other obligation(s) under the contract. However, in the event of termination of the contract in part, the contractor shall continue performance of the contract to the extent not terminated.

## **21. TERMINATION FOR INSOLVENCY**

Tendering Authority may at any time terminate the contract by giving written notice to the contractor without compensation to the contractor if he becomes bankrupt or otherwise insolvent, provided that such termination will not prejudice or affect any right of action or remedy, which has accrued or will accrue thereafter to the Tendering Authority.

## **22. TERMINATION FOR CONVENIENCE**

Tendering Authority may vide a written notice sent to the supplier; terminate the contract, in whole or in part at any time for its convenience. The notice of termination shall specify that termination is for the purchaser's convenience in the interest of Tendering Authority.

## **23. COMPLETION OF WORK**

On completion of the work, the contractor shall submit 5 sets of "As Executed Report" to the Tendering Authority which will include photographs, drawings and as executed reports of various

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systems containing details of installation from the point of view of future maintenance of the installed systems. This report must also contain all Technical Details, Detailed Circuit Diagram of the Electronic/ Electrical components of all the systems.

## **24. OTHER CONDITIONS**

**24.1** The contractor shall not transfer, assign or sublet the work under this contract or any substantial part thereof to any other party without the prior consent of the Tendering Authority in writing.

**24.2** Tendering Authority may at any time either stop the work all together or reduce or cut it down by sending notice in writing to the contractor. If the work is stopped all together, the contractor will only be paid for work done and expenses distinctly incurred by him as on preparation or the execution of the work up to the date on which such notice is received by him. The decision of the Tendering Authority regarding assessment of such expenses shall be final and binding on the contractor. If the work is cut down, the contractor will not be paid any compensation whatsoever for the loss of profit which he might have made if he had been allowed to complete all the work awarded to him.

**24.3** Fulfilment of various requirements not particularly mentioned in the specifications or drawings but necessary for satisfactory and proper completion of the work shall be the contractor's responsibility within the prices offered by him. But additional works beyond the scope and essence of this contract shall be carried out by the contractor as extra items. For such works the rates shall be decided by Tendering Authority and shall be binding on the contractor.

**24.4** Work carried out without Tendering Authority's approval shall not be accepted and Tendering Authority shall have rights to get it removed and to recover the cost so incurred from the contractor.

**24.5** The contractor shall not display the photographs of the work and not take advantage through publicity of the work without written permission of the Tendering Authority.

**24.6** The contractor shall not make any other use of any of the documents or information of this contract, except for the purposes of performing the contract.

**24.7** Tendering Authority will not be bound by any Power of Attorney granted/ issued by the contractor or by any change in the composition of the firm made during or subsequent to the execution of the contract. However, recognition of such Power of Attorney and change (if any) may be given by the Tendering Authority after obtaining proper legal advice, the cost of which will be chargeable to the contractor concerned.

## **25. STATUTORY ACTS**

**25.1** All legal formalities/clearances are to be obtained by the contractor regarding the execution of the said work.

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**25.2** In respect of all labour directly or indirectly employed on the work by the contractor, the contractor shall comply with all the provisions of hiring the contract labour and rules of State/ Central Government or any other authority framed from time to time. The rules and other statutory obligations in this regard will be deemed to be the part of this contract.

**25.3** The contractor shall comply with all the Acts & rules and regulations, laws and by-laws framed by State/ Central Government/ Organization in whose premises the work has to be done. Tendering Authority shall have no liabilities in this regard.

## **26. APPLICABLE LAW**

The contract shall only be interpreted under Indian laws. The Tendering Authority shall have exclusive jurisdiction in all matters arising under this contract.

## **27. RESOLUTION OF DISPUTES / ARBITRATION**

**27.1** The purchaser and the supplier shall make every effort to resolve any disagreement or dispute arising between them under or in connection with the contract, amicably by direct informal negotiation.

**27.2** If after thirty (30) days from the commencement of such informal negotiations, the purchasers and the supplier are unable to resolve a contract dispute amicably; the matter may be referred in writing by either party to the sole arbitration of the Tendering Authority or to a person nominated by the authority.

**27.3** Subject to aforesaid, the arbitration and conciliation Act 1996 and rules made thereafter or any statutory modifications thereof for the time being in force shall be deemed to apply to the arbitration proceedings. Under this cause, the 'Award' given by the Arbitrator shall be binding on all the parties. The contractor shall not have the right to challenge the Award.

**27.4** Work under the contract shall if reasonably possible, continue during the arbitration proceedings and dues if any, payable by Tendering Authority to the contractor with respect to the work not in dispute shall not ordinarily be withheld on account of such proceedings unless it becomes necessary to withhold the same.

**27.5** The proceedings, if any, in relation to the arbitration referred to above, shall be held by the arbitrator aforesaid at CIPET CSTS Imphal and under Imphal jurisdiction only to entertain and decide the matter involved.

**27.6** No decision given by the officer in charge of the work under this contract, in accordance with the forgoing provisions shall disqualify him as being called as a witness or giving evidence before the arbitrators on any matter whatsoever relevant to the dispute of difference referred to the arbitrator as aforesaid.

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**27.7** In case during the Arbitration proceedings the appointed Arbitrator becomes unable, due to any reason whatsoever, to continue with the proceedings or making of Award; it will be prerogative of the Tendering Authority to nominate any other person as sole Arbitrator instead thereof. The contractor shall not raise any objection to such an appointment having been made by the Tendering Authority.

**27.8** The High court of Imphal or Courts subordinate at Imphal to it as the case may be, shall alone have jurisdictions to the exclusion of all other courts.

## **28. NOTICES**

**28.1** Any notice to be given by one party to the other, pursuant to the contract shall be sent in writing/email. A notice shall be effective when delivered or from the effective date mentioned in the notice, whichever is later.

**28.2** Notices, statements and other communications sent by the Tendering Authority to the contractor at his specified addresses through registered post/ email/ fax shall be deemed to be delivered to the contractor.

## **29. APPLICATION**

These general conditions shall apply to the extent that provisions in other parts of the contract do not supersede them.

## **30. PAYMENT TERMS**

Payment shall be made as following: -

**30.1** After placement of work order, 25% amount of the work order value shall be released as mobilization advance after submission of security deposit in favour of **“CIPET Imphal” payable at Imphal.**

**30.2** 45% amount of the work value shall be paid after installation and commissioning of the Solar Power Plant at site and confirming to technical specification as specified. In Case 25% mobilization advance has not been taken by the firm 70% of the value of the work order shall be released at this stage.

**30.3** Submission of various documents as mentioned in “General Technical Specification” shall be mandatory for release of payment specified in clause no. 30.1 / 30.2.

**30.4** 30% amount of work value shall be released after 3 months from the date of installation and commissioning of solar PV Power plant at site subject to successfully passing the performance ratio test. It will be mandatory to submit the following documents along with the submission of bills for 30% payment against this clause.

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i) Proof of submission of documents to applicant as per clause mentioned under “General Technical Specification”.

ii) Submission of site-specific documents as per clause mentioned under “General Technical Specification”.

**30.5** 10% performance security money deposited by the contractor at the time of placement of work order shall also become payable at completion of 5 years warranty & AMC period.

**Note**

1. No price escalation due to any reason (including any change in the applicable taxes, duties, surcharge etc.) shall be considered by Tendering Authority during the validity/ extended validity of the contract agreement

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# **PART-4**

## **GENERAL TECHNICAL SPECIFICATIONS**

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## GENERAL TECHNICAL SPECIFICATIONS

### 1. PV MODULES:

**1.1.** The PV modules must conform to the latest edition of any of the following IEC /BIS /IS 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 or Equivalent IS (Under Dev.)

**1.3.** PV Modules to be used in a highly corrosive atmosphere must qualify Salt Mist corrosion Testing as per IEC 61701/ IS 61701.

**1.4.** IV Curve both soft copy & hard copy must be provided (Image / PDF)

### 1.5. IDENTIFICATION AND TRACEABILITY

Each PV modules 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 modules).
- iv. Country of origin (separately for solar cells and modules).
- 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 the 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 modules 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 can be inside the module laminate.

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

The BOS items / components of the SPV power plants/ systems must conform to the latest edition of IEC / Equivalent BIS Standards / MNRE specifications as specified below:

<b>Component name</b>	<b>Applicable BIS /Equivalent IEC Standard or MNRE Specifications</b>
Inverter	<p><b>IEC 62109-1,2:</b> Safety of power converters for use in photovoltaic power systems -</p> <p><b>Part 1:</b> General requirements, and Safety of power converters for use in photovoltaic power systems.</p> <p><b>Part 2:</b> Particular requirements for inverters. Safety compliance (Protection degree <b>IP 65</b> for outdoor mounting, <b>IP 54</b> for indoor mounting).</p> <p><b>IEC/IS 61683:</b> Photovoltaic Systems – Power conditioners: Procedure for Measuring Efficiency (10%, 25%, 50%, 75% &amp; 90-100% Loading Conditions).</p> <p><b>IEC 60068-2 (1, 2, 14, 30 &amp; 64):</b> Environmental Testing of PV System – Power Conditioners and Inverters.</p>
Battery	<p><b>IEC 61427-1:</b> (Secondary cells and batteries for renewable energy storage - General requirements and methods of test - Part 1: Photovoltaic off-grid/Hybrid application).</p> <p><b>IS 1651:</b> Stationary Cells and Batteries, Lead- acid type [with Tubular positive plates].</p> <p><b>IS 13369:</b> Stationary lead-acid batteries [with tubular positive plates] in monobloc containers.</p>



Cables	<p><b>IEC 60227/IS 694, IEC 60502/IS 1554 (Part 1 &amp; 2):</b></p> <p>General test and measuring method for PVC (Polyvinyl chloride) insulated cables (for working voltages up to and including 1100 V, and UV resistant for outdoor installation).</p> <p><b>BS EN 50618:</b> Electric cables for photovoltaic systems (BT(DE/NOT)258), mainly for DC cables.</p>
Connectors	Certified for applications with modules according to <b>IEC 61730</b>
Array box	Protection: <b>IP 65</b> enclosures with transparent covers with Surge Protection Device (SPD) class-I/II, DC Fuse with holder and string disconnecter.
Weather monitoring system	<b>IS/IEC 61724 (1998):</b> Photovoltaic System Performance Monitoring - Guidelines for Measurement, Data exchange and Analysis
Supervisory control and data acquisition (SCADA)	Protocol defined for substation automation: <b>IEC 61850</b>
Cable glands	<b>IEC 62444:2010</b>
Cable Lugs	<b>IEC 1238 part 1:</b> Applies to electrical and mechanical properties of cable lugs
Cable ties, ferrules	<b>IEC 62275, IEC 61300</b>
Cable Trays	<b>IEC 1084-2:</b> Specifies requirements for cable trunking and ducting systems intended for mounting on walls or ceilings.

Lightning arrestor	<p><b>IEC 62561 Series (Chemical earthing):</b></p> <p><b>IEC 62561-1:</b> Lightning protection system components (LPSC) – <b>Part 1:</b> Requirements for connection components</p> <p><b>IEC 62561-2:</b> Lightning protection system components (LPSC) – <b>Part 2:</b> Requirements for conductors and earth electrodes</p> <p><b>IEC 62561-7</b> Lightning protection system components (LPSC) – <b>Part 7:</b> Requirements for earthing enhancing compound.</p>
Fuses	<p><b>IS/ IEC 60947 (Part 1, 2 &amp; 3), EN 50521:</b> General safety requirements for connectors, switches, circuit breakers (AC/ DC).</p> <p><b>IEC 60269-6:</b> Low-voltage fuses.</p>

\* In Case if the charge controller is inbuilt in the inverter, no separate IEC 62093 test is required and must additionally conform to the relevant National/ International Electrical Safety Standards wherever applicable.

\* Various components of solar Power plants must additionally conform to the relevant National/International Electrical safety standards wherever applicable.

\* The minimum capacity of PCU/ Inverters (in KVA) should be kept at least equal to the total wattage of solar modules of the system (in kWp).

### 3. MODULE MOUNTING STRUCTURE

Modules shall be mounted on non-corrosive support structures towards due south and at a suitable inclination to maximize annual energy output. Support structure design and foundation or fixation mounting arrangements should withstand horizontal wind speed up to 150 km/ hr. In snowbound areas the structure should be capable of withstanding loads of snow. Support structures shall be manufactured with steel angles & channels; spray galvanized to IS 1477 Part - 1 with thickness of 80 microns as per IS 5905. All fasteners shall be of Stainless steel - SS 304. The mounting structure shall be designed in such a way that it will occupy minimum space without sacrificing the output from SPV modules. Specially designed Aluminium structures may also be offered for better protection against the corrosion over the life of the plant. While making Civil & Mechanical design, due consideration will be given to all the dead loads, live loads, effects of wind load, Seismic factors for the site and suitable Design margins as per prevalent Indian standard and Industry practices.

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#### 4. DC DISTRIBUTION BOARD (DCDB)

A DCDB shall be provided in between PCU and Solar Array. It shall have MCCB of Suitable rating for connection and disconnection of array section. It shall have meters for measuring Array voltage and Array current.

#### 5. DOCUMENTATION

The contractor Shall provide various documents as per following:

##### A. Documents to Tendering Authority

i. Site specific documents to be submitted (with bill for payment against clause no. 30.2/30.3 of payment terms).

- Photograph of all the equipment of Power Plant (hard copy & soft copy).
- Summary details of the plant (annexure-I).
- Joint inspection report from district level officer of..... (annexure-II).
- Certificate for Handing over the system to beneficiary (annexure-III).
- Letter towards Warranty of the system (annexure-IV).
- Performance ratio test for satisfactory functioning of the system (annexure-V).
- Contact details of various service centres.
- User manual for solar power plant including details for operation and maintenance.
- Routing diagram of cables and wires.

ii. Documents to be submitted for one time for every make of component (with bill for payment against clause no. 30.2/30.3 of payment terms).

- a) Undertaking from Solar PV Panel Supplier for modules being indigenous.
- b) IEC certificate module-IEC 61215/61646/62108.
- c) IEC certificate for module safety qualification -IEC 61730.
- d) Test certificate for Inverter/PCU-IEC 61683 and IEC 60068-2.
- e) IS 2062 certificate for module mounting frames and leg assemblies.
- f) Stand report for mounting structure to withstand wind load of 150 Km/H.
- g) Cable certificate-IEC 60227/IEC60502.
- h) Switch, Circuit breakers, connectors certificate-IEC 60947 part I, II, III/ IS 60947 part I, II, III/EN 5052.
- i) Junction boxes certificate confirming to IP 65/21 as per IEC 529.
- j) Lighting arrester certificate – IS 3043-1986.
- k) Surge protection certificate – IS 60364-5-53.

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- l) Layout of solar modules.
  - m) All other drawings/ sketch/ line diagram.

## **6. AUTHORIZED TESTING LABORATORIES/CENTERS**

Test certificates / reports can be from any of the NABL/ IEC accredited testing laboratories or MNRE approved test centres.

## **7. MAIN FEATURES & OPERATING MODE**

- Clean regulated power to the load.
- “No-break” transfers from renewable energy to battery and battery to grid.
- MPPT solar charge regulator.
- The PCU shall operate with solar priority for feeding load and charging batteries.
- Stored power from batteries shall be the second priority to feed the load.
- Grid power shall be the last priority to feed the load. During such time, the PCU shall feed the load directly through the grid and shall also charge the batteries. Battery Charging through Grid shall be taken up only when batteries are undercharged and solar is not available or insufficient.

## **8. WARRANTY**

PV modules used in Solar PV Power Plant 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. 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 Solar SPV Power Plant/system must be warranted against any manufacturing/ design/ installation defects for a minimum period of 5 years. The Warranty/ Guarantee Card to be supplied with the Solar PV Power Plant must contain the details of the system supplied, as given in the Annexure-IV. The tenderer can provide additional information about the system.

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## **9. OPERATION MANUAL**

An Operation, Instruction and Maintenance Manual, in English, should be provided with the Solar PV Power Plant and detail of Wiring and Connection Diagrams will also be provided with the manual.

## **10. OTHER FEATURES**

Only indigenously manufactured Solar PV Modules which fully conform to the MNRE specifications shall be procured. All the technical & other requirements as per provisions under JNNSM of MNRE must be fulfilled. Use of imported Solar PV Modules is not permitted.

## **11. CAUTION SIGNS**

The standard caution and danger boards or labels as per Indian Electricity Rules, the AC distribution box near the solar inverter and the building distribution board to which the AC output of the solar PV system is connected Shall be provided with a noncorrosive caution label.

## **12. QUALITY AND WORKMANSHIP**

Solar PV Modules are designed to last 25 years or more. It is therefore essential that any system components and parts, including the mounting structures, cables, junction boxes, distribution boxes and other parts also have a life cycle of at least 25 years. Therefore, all works shall be undertaken with the highest level of quality and workmanship. During inspection Tendering Authority and its representatives will pay special attention to neatness of work execution and conformity with quality and safety norms. Non-compliant works will have to be redone at the cost of the Installer.

## **13. OTHER REQUIREMENTS**

The other referred Technical specifications have been prescribed by MNRE shall have to be maintained accordingly. Any supplies which have not been specifically mentioned in this contract but which are necessary for the design, engineering, manufacture, supply & performance or completeness of the project shall be provided by the contractor without any extra cost and within the time schedule for efficient and smooth operation and maintenance of the SPV Plant.

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## **TECHNOLOGY SELECTION:**

### **About proposed Hybrid Solar PV System:**

This system connected together with Solar PV, Battery and Utility Grid. Normally the solar PV charges the battery and cater electricity to consumer load through Inverter via battery or directly. Here solar power used in priority mode as per configuration availability and requirements. The Grid power used to cater the consumer load when the battery goes down to deep discharge mode due to less PV power or no PV power. The Grid power continues to cater the load till battery state of charge comes upto 20%. After that the system returns back to Solar & Battery mode for optimal uses of solar power and to maintain the energy security

## **TECHNICAL SPECIFICATION:**

### **CODES AND STANDARDS:**

All equipment and materials to be furnished under this specification shall be designed, manufactured and tested in accordance with the latest revisions of the relevant Indian Standard IEC/IS as applicable.

The electrical installation shall meet the requirement of Indian Electricity Act, and Indian Electricity Rules as amended up-to-date and also the applicable section of the latest revision of the relevant IS Code of Practice.

Material shall be as per this document of technical specification. Any left-out specification(s) (if any) shall be as per the relevant guidelines/specification of the of the MNRE.

### **SOLAR PHOTOVOLTAIC MODULES:**

The total solar PV array capacity should not be less than the SPV plant capacity on max. radiation day and shall be comprise of Polycrystalline modules of 330 wp. The Photovoltaic modules shall be tested & approved by one of the IEC authorized test centres, Test Certificates can be from any of the NABL/ BIS accredited testing / calibration laboratories the module type must be qualified as per IEC 61215(Second Edition). In addition, PV modules must qualify to IEC 61730 Part I to II for safety qualification testing. PV module junction box shall be IP65 protection class as per IEC 529.SPV module conversion efficiency shall be greater than 16% under STC.

The PV module shall perform satisfactorily in humidity up to 100 % with temperature between (-) 10 deg. C to + 85 deg. C. Since the modules would be used in a high voltage circuit, the high voltage insulation test shall be carried out on each module and a test certificate to the effect provided.

The module shall have warranty of 25 years with degradation of power generated not exceeding 20% of the minimum rated power over the 25 years' period and not more than 10% after 10 years period as per MNRE guidelines. Only indigenous solar modules to be used as per MNRE GOI guidelines.

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**OTHER GENERAL REQUIREMENTS FOR THE PV MODULES AND SUBSYSTEMS SHALL BE THE FOLLOWING:**

- Raw materials and technology employed in the module production processes shall not be considered relevant so long as the given specifications are satisfied.
- The rated output power of any supplied module shall not have negative tolerance.
- The peak-power point voltage and the peak-power point current of any supplied module and/or any module string (series connected modules) shall not vary more than 3 (three) per cent from the respective arithmetic means for all modules and/or for all module strings, as the case may be.
- Except where specified, the front module surface shall consist of impact resistant, low-iron and high-transmission toughened glass.
- The module frame, if any, shall be made of a corrosion-resistant material which shall be compatible with the structural material used for mounting the modules.
- The module shall be provided with a junction box with provision of external screw terminal connection and with arrangement for provision for by-pass diode. The box shall have hinged, weather proof lid with captive screws and cable gland entry points of may be of sealed type.
- Necessary I-V curves are required to be furnished along with the SPV modules.

**IDENTIFICATION AND TRACEBILITY**

Each PV module used in any solar power project must use a RF Identification Tag12 (RFID), which must contain the following Information. The RFID will be inside, the module laminated, but must be able to withstand harsh environmental Conditions.

Name of the manufacturer of PV Module

- Name of the manufacturer of solar cells
- Month and year of the manufacturer (separately for solar cells and modules.
- Country of Origin (separately for solar cells and modules
- I-V Curve for the module
- Peak Wattage,  $I_m$ ,  $V_m$  and FF for the module
- Unique Serial No and Model No of the Module
- Date and year of obtaining IEC PV module qualification certificate.
- Name of the test lab issuing IEC certificate

**MODULE MOUNTING STRUCTURES:**

Wherever required, Suitable number of PV panel structures shall be provided. Structures shall be of flat-plate design with combination of I, C and L sections as per structure design requirement. Structural material shall be corrosion resistant and electrolytically compatible with the materials used in the module frame, its fasteners, nuts and bolts. Galvanizing should meet ASTM A-123 hot dipped galvanizing or equivalent which provides at least spraying thickness of 80 microns as per IS5909, if steel is used.

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Aluminium extruded frame structures with adequate strength and in accordance with relevant BIS standards can also be used with proof that the design of the structure can withstand the wind speed of 180 km per hour as per BIS Standards.

Structures shall be supplied complete with all members to be compatible for allowing easy installation at the rooftop site. The Structure shall be made out of either Galvanized steel or Aluminium member as per design to be submitted by firm. The structures shall be designed to allow easy replacement of any module.

Each panel frame structure be so fabricated as to be fixed on the rooftop column/wall structures. The structure should be capable of withstanding a wind load of 180 km/hr after grouting & installation. The front end of the solar array should not be less than 50 cm from the roof. Grouting material for SPV structure shall be as per M15 (1:2:4) concrete specification.

The structures shall be designed for simple mechanical and electrical installation. There shall be no requirement of welding or complex machinery at the installation site. If prior civil work or support platform is absolutely essential to install the structures, the supplier shall clearly and unambiguously communicate such requirements along with their specifications in the bid. Detailed engineering drawings and instructions for such prior civil work shall be carried out prior to the supply of Goods.

The supplier shall specify installation details of the PV modules and the support structures with appropriate diagrams and drawings. Such details shall include, but not limited to, the following;

- Determination of true south at the site
- Array tilt angle to the horizontal, with permitted tolerance
- Details with drawings for fixing the modules
- Details with drawings of fixing the junction/terminal boxes
- Interconnection details inside the junction/terminal boxes
- Structure installation details and drawings
- Electrical grounding (earthing)
- Inter-panel / Inter-row distances with allowed tolerances; and Safety precautions to be taken.

As per need of aesthetic look, the structure may be kept as non-penetrating type on roofs of building having low height (one or two storied). The array structure shall support SPV modules at a given orientation and absorb and transfer the mechanical loads to the rooftop columns properly. All nuts and bolts shall be of very good quality stainless steel except foundation bolts which will be of MS (GI Coated).

The array structure shall be made of hot dip galvanized MS angles or galvanized tubular frame. The minimum thickness of the galvanization should be at least 80 microns. Minimum Ground Clearance of the lowest part of the module structure should be at least 300 mm. All fasteners for supporting conduits, Nut & Bolts shall be of stainless steel (Grade SS 304), supporting structures including module mounting structure shall have to be adequately protected against all climatic condition. Entire structure shall be placed on the roof. Punching or bolting on the roof shall not be permitted. However entire system may be placed by providing concrete blocks. In case to



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meet maximum wind load criteria, if fasteners are to be provided, adequate clearance from the authority with regard to the civil structural component of the roof is to be obtained. However it will be the responsibility of the party to ensure leak proof construction in any case.

#### **ARRAY JUNCTION BOX(AJB)/ DC Distribution Box:**

Array Junction Box / DC Distribution Box to receive the DC output from the array field with provision of SPD (surge protection device) and Diode circuit or Fuse. Each PCU has independent Array Junction Box. Array junction box shall be IP65 protection class as per IEC529. The mounting of the accessories in the Combiner Box should be DIN Rail type.

#### **POWER CONDITIONING UNIT (PCU):**

The Power Conditioning Unit (PCU) is an integral part of DSP based bi-directional Inverter and MPPT based Solar Charge Controller together within a single Unit. Inverter shall be able to convert the direct current (DC) electricity generated by the solar PV array or stored electricity in the battery into alternating current (AC) electricity to cater electrical loads and the charge controller is used to charge the battery from Solar PV array keeping solar PV electricity as a priority mode.

The PCU shall be highly efficient based on Maximum Power Point Tracking (MPPT) control with IGBT based design. MPPT must be able to extract maximum energy from Solar array and produce 415 V, 3-ph, 50Hz AC to synchronize with the grid through LT panels.

MPPT controller, inverter and associated control and protection devices etc. all shall be integrated into PCU. MPPT voltage range shall be compatible with the array voltage. The rating of PCU(s) shall be suitable to meet Solar PV array capacity and is of Hybrid Type. It shall have protection features such as Reverse-polarity protection, Reverse current to PV array protection Short circuit, over voltage, under voltage protection, over current on DC side. In addition to this it shall have PV array Isolation switch (DC) & AC Isolation Switch (soft switch and manual switch). The system should be capable of providing all the data including that of meter and Inverter to the central monitoring unit.

PCU shall continuously monitor the condition of the grid. In the event of grid failure, it shall disconnect from grid exporting (if any) available and shall act as standalone system for Battery charging. PCU shall conform to IEC 61683/IS 61683 standards for efficiency measurements, IEC 60068 for environmental testing and IEC62116 for Islanding. PCU should be communicable on remote sensing. PCU shall have facility to display basic parameters of the system through LEDs & LCD display.

#### **PROTECTIONS:**

- Under/Over Voltage protection for Input, Output, Array & Battery

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- Array & Battery reverse polarity
  - Output Overload
  - Short Circuit
  - Over Temperature
  - MCCB at Input, Output, Array and Battery Path
  - Surge protection for Grid and Array

#### **ON LINE DATA LOGGER AND REMOTE MONITORING UNIT:**

Data logging system may be an integrated part of PCU or a separate unit. The data logging system includes PV monitoring system also. The data Logger should have the provision for recording the data associated with electrical parameters at different stages to study performance of system as well as to study status of the system at a particular instant. The data logger should have required transducer to monitor and record the required system data. The data logger shall have reliable battery backup and data storage capacity to record all sorts of data simultaneously round the clock.

Data Logger and Remote monitoring must be compatible with data logger software. The other required accessories, hardware and compatible software shall have to be provided as an integrated part of the system to monitor the data.

#### **METERING:**

PV array energy production: Digital Energy Meters to log the actual value of AC/ DC Voltage, Current & Energy generated by the PV system shall have to be provided for each SPV plant.

#### **AC DISTRIBUTION BOX / GRID INTERFACE PANEL:**

ACDB shall have the arrangement for measuring all electrical quantities such as Voltage, Current, Frequency, of different feeder line & energy supplied to the different feeder or main feeder. ACDB shall have the provision of visual indication of existence of power input & output through MIMIC diagram. It shall have sheet iron enclosure of dust & vermin proof & shall have adequate cooling arrangement. The bus-bars are to be made of copper of desired size. Design & Drawing is to be submitted before manufacturer assembly on installation for obtaining necessary approval from Engineer-in-Charge. The panel will be having space for 3 Phase Bi-directional. The panel should have a manual isolation switch in order to isolate the plant from the grid.

#### **CABLES:**

ISI marked as per given brands PVC/XLPE insulated Copper Cond. Cable of various sizes as per load requirement for connecting all the modules / arrays to Jn. Boxes and from Jn. Boxes to DC distribution box and from DC distribution box to PCU. Copper/ Aluminium Cables of appropriate size from PCU onwards in A.C. side should be made.

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Cabling in the yard shall be carried out as per IE Rules. Cabling inside control room and array area should be in cable pipes with proper water/moisture protection sealing. All other cabling above ground should be suitably mounted on cable trays with proper covers.

Only copper wires of appropriate size and of reputed make shall have to be used. On D.C. side only D.C. solar Cu cable to be used. However, aluminium cables can be used on A.C side of transmission.

All connections are to be made through suitable cable/lug/terminals; crimped properly & with use of Cable Glands. All cable/wires are to be marked with proper manner by good quality ferule or by other means so that the cable can be easily identified. All fasteners shall be made of Stainless steel.

#### **LIGHTNING PROTECTION:**

SPV Power Plants will be provided with Lightning and Over Voltage Protection connected to proper earth mats. The Lightning conductors shall be provided as per Indian Standards (IS) in order to protect the entire Solar Array yard from Lightning strikes.

There shall be the required number of suitable lightning arrestors installed in the array area. Lightning protection shall be provided by the use of metal oxide arrestors and suitable earthing such that induced transients find an alternate route to earth.

Protection shall meet the safety rules as per Indian Electricity Act. Normally spike type lightning arrester is used, they have special grounding system designed to safely conduct the extremely high voltage current associated with lightning strikes. This spike lightning arrester is durable and latest in design. Necessary concrete foundation for holding the lightning conductor in position will be made after giving due consideration to maximum wind speed. Lightning conductors shall be earthed through flats and connected to earth mats as per applicable IS with Chemical Gel earth pits. The pits are provided with Masonry enclosure with cast iron cover plate having locking arrangement, watering pipe using charcoal and salt as per IS. Normally a lightning arrester is required for 50-meter circumference.

#### **EARTHING PROTECTION:**

Each array structure of the PV yard should be grounded/ Earthing properly as per IS: 3043-1987. In addition the lightning arrester/masts should also be provided inside the array field. Provision should be kept for shorting and grounding of the PV array at the time of maintenance work. All metal casing/shielding of the plant should be thoroughly grounded in accordance with Indian Electricity Act/ IE Rules. Earth Resistance should be tested in presence of the representative of Department after earthing by calibrated earth tester. PCU ACDB and DCDB should also be earthed properly. The earth conduction shall run through appropriate pipes partly buried and partly on the surface of the control room building. The complete earthing system shall be mechanically & electrically connected to provide independent return path to earth.

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Mainly chemical earthing is used, which is bentonite based or graphite-based compound along with earthing electrode that helps in improving soil condition and reducing the soil resistivity. Prime contents include bentonite, graphite, aluminium silicates and metal powders. In general minimum two earth pits must be provided for DC side and two earth pits for the AC side, as per area covered. Earth pits are provided to connect lightning arrester and body earth (modules, MMS).

Suitable, sufficient number of fire extinguishers for all types of fire, shall be provided at plant location. In addition, sufficient number of fire buckets shall also be provided. The fire fighting equipment as above shall be dispersed in a suitable and purposeful manner.

**PROJECT SIGNAGE:**

Project information Signage: The Signage shall be made up of rust-free steel or equivalent materials of minimum size 4ft X 3ft. The Signage provide with detail of the project as approved by IIT/AICTE. The signage shall be prominently embossed.

Safety Signage: Safety Signage will be provided mentioning the level and type of voltage and symbols as per IE Rule at different position as may be required. The control room should have detail display with regard to the complete wiring of the plant layout, safety instructions, Dos and Don'ts, along with danger plates as necessary.

**BATTERY:**

Batteries shall be properly designed to store the solar PV energy to meet the electricity demand at night or in day time when generating solar power is less. Normally Flooded Type Lead Acid battery (LMLA) or T-Gel batteries are used in solar PV application as per IS 1651 or similar BIS standard. In this project T-Gel batteries are preferred.

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# PART-5

## SCOPE OF WORK

### SCOPE OF WORK

**The work shall include Design, Fabrication, Manufacturing, Supply, Installation, Testing & Commissioning of on-grid Solar power plants.**

All works required for proper installation of Solar PV Power Plant including necessary civil and welding works for mounting structures of solar module, shall be done by the contractor. The entire work shall be performed on turnkey basis. All the works related to the proper installation and functioning of the system shall have to be carried out by the contractor in the prices offered by him.

- A.** All necessary electrical wiring from electrical distribution box up to PCU of Solar PV Power Plant and back from PCU to distribution box shall have to be done by the contractor including supply of all required materials.
- B.** The generated electricity from the power plant will be utilized to energize the dedicated load of the building. In case separate additional electric cable/wiring etc is required for connecting the dedicated load with solar power plant, it shall have to be supplied and laid down by the contractor as per requirement at the site and shall be covered in the scope of work. The wiring shall have to be done in concealed conduits.
- C.** The proposed dedicated load to be energized through Solar Power plant shall have to be decided as per the storage capacity of solar Power Plant in consultation with the Tendering Authority.
- D.** Necessary arrangements for storage of batteries of solar PV Power plant as per requirements for their proper protection shall have to be done by the contractor. Appropriate cabinets for battery banks, with the provision of racks for batteries should also be done if required, battery rooms of the adequate size with proper ventilation shall have to be prepared according to the direction of the Tendering Authority.
- E.** After completion of the proposed works, clearances of all temporary works/ materials shall be the sole responsibility of the contractor and this shall be removed immediately after the requirement of such temporary work is completed.
- F.** General Aesthetics & cleanliness in regard to the installation of various systems shall have to be maintained in accordance with the aesthetics of the site.

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- G.** Arrangement of proper earthing mechanism and lightning arresters should be done at site as per the requirements of the solar power plant.
  - H.** The contractor shall supply/install the necessary tools/instruments required for proper operation of the plant and measure PV array Voltage, current, Power and solar radiation.
  - I.** Supply and Installation of Display board of '3ft X 2ft' size showing all technical information of SPV plant shall be done by the contractor. The matter written on these boards shall be as per annexure-I.
  - J.** Warranty, operation and Maintenance period will include rectification/ replacements of all the defective and consumable components/ items including batteries. However, all the non-functional parts/ materials/ items replaced during the warranty, operation and maintenance period shall be the property of the contractor. After commissioning of the plant, the contractor will conduct one on-site training of the purchaser's /user's personnel regarding assembly, start-up, operation, maintenance and repairs of the Solar PV Power Plant.
  - K.** During the 5 year's warranty, operation & maintenance period, the contractor Will have to make all necessary arrangements for satisfactory operation, maintenance and performance of the Power Plant.
  - L.** Rectification of all the defects developed in the Solar PV Power Plant during warranty, and maintenance period shall have to be done by the contractor promptly, at the most within 10 days from the date of receipt of complaint.
  - M.** During Warranty, operation and Maintenance period, the contractor shall have to submit an annual performance & functionality report.
  - N.** For proper functioning and maintenance of Solar Power Plant, contractors shall have to appoint at least one representative who has proper knowledge about the functioning of the solar plant for technical assistance on behalf of the contractor with whom the Tendering Authority can contact during the contract or warranty period.

During the warranty, operation & maintenance period, the Tendering Authority will have all rights to cross check the performance of the Solar PV Power Plant, the Tendering Authority may randomly pick up its components to get them tested at Govt. / MNRE approved any test centre. If during such tests any part is not found as per the specified technical parameters, the Tendering Authority will take the necessary action to recover the losses and to black list the firm and the same may be communicated to MNRE and other nodal agencies. The decision of the Tendering Authority in this regard will be final and binding on the contractor.

# PART-6

## ESTIMATED COST

### Design, Supply, Installation & Commissioning of 30 KWp On-Grid Solar PV Power

Total Estimates Cost INR 20,00,000/-

### Major components of the power plant, technical specification.

Capacity of the proposed SPV plant (kW <sub>p</sub> )	: 30 kWp
No. of modules	: 68 No of bifacial module with 445 Wp
PV Module type (Mono/Multi)	: Mono
<i>PV Module parameters</i>	
Maximum Power Rating (W)	: 445 or above
Rated Power Current (Imp)	: 10.90 A
Rated Power Voltage (Vmp)	: 40.8 V
Short Circuit Current (A)	: 11.46 A
Open Circuit Voltage (V)	: 49.4 V
Electrical conversion efficiency (%)	: 20 %
No. Inverter/ Power Conditioning Unit (PCU)	: 1
<i>Inverter/ PCU specifications</i>	
Rated Capacity	: 30 KW
Input Voltage	: DC 360 V and above
Output Voltage Range	: 3 Phase 415 V
Frequency	: 50 Hz
Efficiency	: 96 %
Type of battery	: NA
No. of battery required	: NA
Rated capacity (Ah) and Voltage (V)	: NA
Mounting requirement (Specify material)	: Hot Dip Galvanized
Cables requirement (in m) DC cables AC cables No. of MC4 connector	: As per requirement
Earthing, earthing mat and lightning arrester (Type and material)	: Chemical Earthing 2 Nos Lightning Arrester 2 Nos Arrester
No. of Array Junction Box	: As per requirement
No. of DCDB	: As per requirement
No. of ACDB	: As per requirement
Supervisory control and data acquisition (SCADA), if any	: Remote monitoring with Inverter
Cable trays, ties, lugs, ferrules, glands etc.	: Lumpsum
Transformer with specification, if any	: N/A
Net-meter, if any	: 1 No
No of street light with pole structure	: N/A

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Any other component not covered above	:	Installation Cost and maintenance for 5 years
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# PART-7(A)

## TECHNICAL BID

(All Tables To be filled in Excel Format Only)

Sl. No.	Particulars To Be filled up by the Tenderer / Bidder:	
1	Name of the Tenderer / Supplier	
2	Postal address	
3	Telephone No. with STD code	
4	Fax with STD code	
5	Name of Contact person	
6	Mobile No.	
7	E-Mail ID	
8	Following Documents to Be Scanned and Uploaded in the website <a href="http://www.tenderwizard.com">www.tenderwizard.com</a> / <a href="#">CIPET</a> during the period of submission.	
8a	The firm should have valid registration certificate in support of establishment of the firm (Registration No.)	
8b	PAN (Permanent Account Number)	
8c	Certificates of Registration for GST as applicable (GST Number)	
8d	The firm should furnish the balance sheet and Income-Expenditure Account of last Three Financial Years. (up to FY – 2019-20)	Yes / No
8e	The firm should enclose copy of Income Tax Return of the last Three Assessment Years (up to Assessment Year 2020-21)	Yes / No
8f	Demand Draft No. & Date for Tender Fees (Non-refundable) of Rs. 3,000/-	

8g	Demand Draft No. & Date for EMD of Rs.70,000/- (in case applicable)	
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**Tender No.: CIPET/CSTS/IMP/ADMIN/E-TENDER/01/HSP/dated 22.01.2023.**

**For Design, Supply, Installation & Commissioning of 30 KWp On-Grid Solar PV Power Plant**

**1. Solar PV Modules**

Sl.	Details regarding	Proposed by tenderer
1	Name of the manufacturer & Make of Solar Module	
2	Type of Solar Cell	
3	Make of Solar cell	
4	Specification of solar Module	Wp                  Voc                  Isc Vm                  Im                  FF
5	Type of Frame Structure (MS/SS)	
6	Enclosed supporting documents if any	From Page No..... to.....
7	Details in case of any deviation from them technical specifications as specified in the tender document.	

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## 2. BoS Items/Component

SI	Details regarding	Proposed by tenderer
1	Name of the manufacturer & Make of PCU/ Inverter	
2	Name of the manufacturer & Make of Charge Controller/ MPPT Units	
3	Name of the manufacturer & Make of Switches/Circuit Breaker/ Connectors	
4	Name of the manufacturer & Make of Cables	
5	Name of the manufacturer & Make of array boxes	
6	Name of the manufacturer & Make of Lightning Arrestor	
7	Name of the manufacturer & Make of fuses	
8	Enclosed supporting documents if any	From Page No..... to.....
9	Details in case of any deviation from the technical specifications as specified in the tender document.	

(Attach additional sheets if required)

**(Signature of tenderer With Seal)**

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## DETAILS OF EXPERIENCE

Please fill in information about the Solar PV Systems installed in the last three years by the Tenderer.

Details	Year		
	2018-19	2019-20	2020-21
Total Capacity of PV Installed (KW)			
Total Contract Amount			

(Account Details should be submitted with CA certification)

**(Signature of tenderer With Seal)**

**NOTE: Above details without copies of work orders, completion certificates, satisfactory performance reports from the users and CA certificate will not be considered.**

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**PART-7(B)**  
**FINANCIAL BID**

**NAME OF THE WORK: -DESIGN, SUPPLY, INSTALLATION& COMMISSIONING OF 30 kW ON-GRID SOLAR PV POWER PLANT AT CIPET IMPHAL.**

JOB NO.	JOB DESCRIPTION	QTY.	UNIT	RATE (IN RS)	AMOUNT (IN RS)
<b>PHASE 1</b>	<b>SUPPLY OF NECESSARY EQUIPMENTS</b>				
JOB 1	SUPPLY OF PV MODULE				
JOB 2	SUPPLY OF PCU				
JOB 3	SUPPLY OF MODULE MOUNTING STRUCTURE				
JOB 4	SUPPLY OF DCDB WITH ALL COMPONENTS				
JOB 5	SUPPLY OF ACDB WITH ALL COMPONENTS				
JOB 6	SUPPLY OF DC CABLE				
JOB 7	SUPPLY OF AC CABLE				
JOB 8	SUPPLY OF CONNECTORS,SWITCHES, CIRCUIT BREAKER				
JOB 9	SUPPLY OF CABLE TRAYS				
JOB 10	SUPPLY OF LIGHTNING ARRESTOR				
JOB 11	SUPPLY OF MATERIAL FOR EARTHING				
JOB 12	SUPPLY OF CABLE GLANDS,LUGS,TIES, FERRULES				
TOTAL AMOUNT					
<b>PHASE 2</b>	<b>INSTALLATION OF THE POWER PLANT WITH ALL THE RELATED NECESSARY SAFETY EQUIPMENTS FOR SATISFACTORY PERFORMANCE</b>				

<b>OF THE PLANT</b>					
JOB 1	INSTALLATION OF THE POWER PLANT				
JOB 2	INSTALLATION OF THE LIGHTNING ARRESTOR				
JOB 3	INSTALLATION OF THE EARTHING				
JOB 4	SUPPLY AND INSTALLATION OF CAUTION AND DANGER BOARDS				
JOB 5	SUPPLY AND INSTALLATION OF DISPLAY BOARD OF  "3ft x 2ft"  WITH ALL THE NECESSARY INFORMATION ABOUT THE PLANT				
TOTAL AMOUNT					
<b>PHASE 3</b>	<b>COMMISSIONING OF THE POWER PLANT AND WARRANTY/AMC</b>				
JOB 1	COMMISSIONING OF THE SOLAR PV PLANT				
JOB 2	WARRANTY/AMC				
TOTAL AMOUNT					

TOTAL AMOUNT PHASE (1+2+3) =

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**(Signature of Tenderer)**

**(Seal)**