



**Kerala  
Tenders**

## eTendering System Government of Kerala

### Tender Details

Date : 03-Jan-2024 12:16 PM

Print

#### Basic Details

<b>Organisation Chain</b>	ANERT		
<b>Tender Reference Number</b>	ANERT-IDK/5/2022-DE(IDK)		
<b>Tender ID</b>	2023_ANERT_630510_2	<b>Withdrawal Allowed</b>	Yes
<b>Tender Type</b>	Open Tender	<b>Form of contract</b>	EPC Contract
<b>Tender Category</b>	Works	<b>No. of Covers</b>	1
<b>General Technical Evaluation Allowed</b>	No	<b>ItemWise Technical Evaluation Allowed</b>	No
<b>Payment Mode</b>	Online	<b>Is Multi Currency Allowed For BOQ</b>	No
<b>Is Multi Currency Allowed For Fee</b>	No	<b>Allow Two Stage Bidding</b>	No

#### Payment Instruments

Online Bankers	S.No	Bank Name
	1	SBI MOPS

#### Cover Details, No. Of Covers - 1

Cover No	Cover	Document Type	Description
1	Fee/PreQual/Technical/Finance	.pdf	Technical Bid
		.xls	Financial Bid

#### Tender Fee Details, [Total Fee in ₹ \* - 2,950]

<b>Tender Fee in ₹</b>	2,950		
<b>Fee Payable To</b>	Nil	<b>Fee Payable At</b>	Nil
<b>Tender Fee Exemption Allowed</b>	Yes		

#### EMD Fee Details

<b>EMD Amount in ₹</b>	25,000	<b>EMD through BG/ST or EMD Exemption Allowed</b>	Yes
<b>EMD Fee Type</b>	fixed	<b>EMD Percentage</b>	NA
<b>EMD Payable To</b>	Nil	<b>EMD Payable At</b>	Nil

#### Work / Item(s)

<b>Title</b>	Retender for the Repair and Reconditioning of 25 kWp Off Grid Solar Power plant at Puravayal Tribal Hamlet, Marayoor, Idukki				
<b>Work Description</b>	Retender for the Repair and Reconditioning of 25 kWp Off Grid Solar Power plant				
<b>Pre Qualification Details</b>	Please refer Tender documents.				
<b>Independent External Monitor/Remarks</b>	NA				
<b>Tender Value in ₹</b>	NA	<b>Product Category</b>	Solar Power Plants	<b>Sub category</b>	NA
<b>Contract Type</b>	Tender	<b>Bid Validity(Days)</b>	30	<b>Period Of Work(Days)</b>	15
<b>Location</b>	Puravayal Tribal Hamlet, Marayoor, Idukki	<b>Pincode</b>	685620	<b>Pre Bid Meeting Place</b>	NA
<b>Pre Bid Meeting Address</b>	NA	<b>Pre Bid Meeting Date</b>	NA	<b>Bid Opening Place</b>	Online
<b>Should Allow NDA Tender</b>	No	<b>Allow Preferential Bidder</b>	No		

#### Critical Dates

<b>Publish Date</b>	01-Jan-2024 03:00 PM	<b>Bid Opening Date</b>	12-Jan-2024 04:00 PM
<b>Document Download / Sale Start Date</b>	01-Jan-2024 03:00 PM	<b>Document Download / Sale End Date</b>	12-Jan-2024 03:00 PM
<b>Clarification Start Date</b>	NA	<b>Clarification End Date</b>	NA
<b>Bid Submission Start Date</b>	01-Jan-2024 03:00 PM	<b>Bid Submission End Date</b>	12-Jan-2024 03:00 PM

#### Tender Documents

<b>NIT Document</b>	<b>S.No</b>	<b>Document Name</b>	<b>Description</b>	<b>Document Size (in KB)</b>
	1	Tendernotice_1.pdf	NIT and Abstract	228.08

  

<b>Work Item Documents</b>	<b>S.No</b>	<b>Document Type</b>	<b>Document Name</b>	<b>Description</b>	<b>Document Size (in KB)</b>
	1	Tender Documents	ReRevival.pdf	Tender Document	639.98
	2	BOQ	BOQ_972065.xls	Financial Bid	342.50

**Tender Inviting Authority**

<b>Name</b>	CEO ANERT
<b>Address</b>	Office of CEO, ANERT Law College Road, Vikas Bhavan. PO, Thiruvananthapuram - 695 033



**AGENCY FOR NEW & RENEWABLE ENERGY  
RESEARCH AND TECHNOLOGY (ANERT)**

Department of Power, Government of Kerala  
Thiruvananthapuram, Kerala – 695 033;  
[www.anert.gov.in](http://www.anert.gov.in) , [projects@anert.in](mailto:projects@anert.in)

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## **E-TENDER DOCUMENT**

***Retender for the Repair and Reconditioning of 25  
kWp Off Grid Solar Power plant at Puravayal  
Tribal Hamlet, Marayoor, Idukki***

**Ref. No.: ANERT-IDK/5/2022-DE(IDK)**

### **PART 1 – GENERAL CONDITIONS**

**Date of Publishing of Bids : - 01/01/2024**

**Last Date of Submission of Bids : - 12/01/2024**

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## E-TENDER NOTICE

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Competitive e-tenders in one cover system with Price Bid in accordance with the ANERT approved technical specifications are invited from ANERT registered vendors for SPV Power plants for the ***Retender for the Repair and Reconditioning of 25 kWp Off Grid Solar Power plant at Puravayal Tribal Hamlet, Marayoor, Idukki***. The e-tender documents can be downloaded from the e-tendering website of Govt. of Kerala. Tender form will not be available in any other form.

Thiruvananthapuram

CEO

01/01/2024

## TENDER ABSTRACT

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Ref. No.	<b>ANERT-IDK/5/2022-DE(IDK)</b>
Name of Work	<b>Retender for the Repair and Reconditioning of 25 kWp Off Grid Solar Power plant at Puravayal Tribal Hamlet, Marayoor, Idukki</b>
Building Site and Requirements	<b>Thiruvananthapuram Corporation limits</b>
Download of Tender Form	<a href="http://www.etenders.kerala.gov.in">http://www.etenders.kerala.gov.in</a>
Last date of submission of Tender	12/01/2024 @ 03.00 PM
Date and Time of opening the Tender	12/01/2024 @ 04.00 PM
Warranty period	5 years from the date of Commissioning
Availability of Tender Forms	Website <a href="http://www.etenders.kerala.gov.in">http://www.etenders.kerala.gov.in</a>
Place of opening of tender	Office of CEO, ANERT Law College Road, Vikas Bhavan. PO, Thiruvananthapuram - 695 033, Kerala

Thiruvananthapuram

12/01/2024

Sd/-  
CEO

## GENERAL TERMS AND CONDITIONS FOR E-PROCUREMENT

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This e-Tender is being published for the Retender for the Repair and Reconditioning of 25 kWp Off Grid Solar Power plant at Puravayal Tribal Hamlet, Marayoor, Idukki. The tender is invited in one cover system through e-procurement portal of Government of Kerala ([www.etenders.kerala.gov.in](http://www.etenders.kerala.gov.in)). Prospective bidders willing to participate in this tender shall necessarily register themselves with above mentioned e-procurement portal.

The tender timeline is available in the critical date section of this tender published in [www.etenders.kerala.gov.in](http://www.etenders.kerala.gov.in)

### 1. ONLINE BIDDER REGISTRATION PROCESS:

1.1 Bidders should have a Class III or above Digital Signature Certificate (DSC) to be procured from any Registration Authorities (RA) under the Certifying Agency of India. Details of RAs will be available on [www.cca.gov.in](http://www.cca.gov.in). Once, the DSC is obtained, bidders must register on [www.etenders.kerala.gov.in](http://www.etenders.kerala.gov.in) website for participating in this tender. Website registration is a one-time process without any registration fees. However, bidders must procure DSC at their own cost.

1.2 Bidders may contact e-Procurement support desk of Kerala State IT Mission over telephone at 0471- 2577088, 2577188, 2577388 or 0484 – 2336006, 2332262 - through email: [helpetender@gmail.com](mailto:helpetender@gmail.com)/[etendershelp@kerala.gov.in](mailto:etendershelp@kerala.gov.in) for assistance in this regard

### 2. ONLINE TENDER PROCESS:

The tender process shall consist of the following stages:

- i. Downloading of tender document: Tender document will be available for free download on [www.etenders.kerala.gov.in](http://www.etenders.kerala.gov.in). However, tender document fees shall be payable at the time of bid submission as stipulated in this tender document.
- ii. Pre-bid meeting: (not applicable)
- iii. Publishing of Corrigendum: All corrigenda shall be published on [www.etenders.kerala.gov.in](http://www.etenders.kerala.gov.in) and shall not be available elsewhere.



- iv. Bid submission: Bidders have to submit their bids along with supporting documents to support their eligibility, as required in this tender document on [www.etenders.kerala.gov.in](http://www.etenders.kerala.gov.in). No manual submission of bid is allowed and manual bids shall not be accepted under any circumstances.
- v. In case bidder encounters any technical issues pertaining to e-Procurement system while acting on the tender, computer screen shot of the error message with date & time stamp on the web-browser along with the query shall be e-mailed by the bidder to the help desk (**helpetender@gmail.com/etendershelp@kerala.gov.in**), for resolution of the problem. At the same time, problem must be intimated to the concerned Tender Inviting Authority via email.
- vi. The time taken to ascertain, evaluate and suggest a solution for the problem reported by bidder may vary from case to case. Hence bidders are advised to submit the bid **at least 2 working days before the due date** and time of bid submission to avoid any last-minute issues that may come up.
- vii. Opening of Bid and Bidder short-listing: The single cover bids will be opened, evaluated and shortlisted as per the eligibility. Failure to submit the required documents online will attract disqualification. Price bids of the eligible bidder's will open the same day of opening and the work will be awarded.

### **3. DOCUMENTS COMPRISING BID:**

3.1 (a) The First Stage - Part-I Pre- Qualification cum Technical Bid with Commercial terms without Price Bid

Technical proposal shall contain the scanned copies of the following documents which every bidder has to upload:

**Envelop -1** shall contain, Part-I (this document in PDF form)/scanned copies of:

- i. Tender documents downloaded (signed with office seal)
- ii. Summary of Bid qualification requirement (Annexure A)
- iii. Agreement in the prescribed format (Annexure B) on Govt. of Kerala stamp paper worth Rs.200/-
- iv. Details of credit rating done, to prove the experience in executing similar orders
- v. Bill of Material

- vi. Details of the technical offer, including test certificates
- vii. Details of site-specific additional costs required

3.1 (b) The Second Stage (Financial Cover as per two cover system):

**Envelop -2:** shall contain the Price Schedule as per BOQ in Excel format for this tender to be downloaded from e-tender website, duly digitally signed by the tenderer/authorized signatory of the tender.

- 3.2 The department doesn't take any responsibility for any technical snag or failure that has taken place during document upload.
- 3.3 The Bidder shall complete the Price bid as per format given for download along with this tender.

Note: The blank price bid should be downloaded and saved on bidder's computer without changing file-name otherwise price bid will not get uploaded. The bidder should fill in the details in the same file and upload the same back to the website.

- 3.4 Fixed price: Prices quoted by the Bidder shall be fixed during the bidder's performance of the contract and not subject to variation on any account. A bid submitted with an adjustable/ variable price quotation will be treated as non-responsive and rejected.

#### 4. SUBMISSION PROCESS:

- 4.1 For submission of bids, all interested bidders have to register online as explained above in this document. After registration, bidders shall submit their Technical bid and Financial bid online on [www.etenders.kerala.gov.in](http://www.etenders.kerala.gov.in) along with online payment of tender document fees and EMD.
- 4.2 For page-by-page instructions on bid submission process, please visit [www.etenders.kerala.gov.in](http://www.etenders.kerala.gov.in) and click "Bidders Manual Kit" link on the home page.
- 4.3 It is necessary to click on "Freeze bid" link/ icon to complete the process of bid submission otherwise the bid will not get submitted online and the same shall not be available for viewing/ opening during bid opening process.

## **5. VALIDITY**

- 5.1 The tender offer shall be kept valid for acceptance for a period of 3 months from the date of opening of offers. The offers with lower validity period are liable for rejection. Further, the tenderer may extend the validity of the Bids without altering the substance and prices of their Bid for further periods, if so required

## **6. DEVIATIONS**

- 6.1 The offers of the Tenderers with Deviations in Commercial terms and Technical Terms of the Tender Document are liable for rejection.

## **7. BLACK LIST**

- 7.1 All the intending tenderers shall agree that in the event of the documents furnished with the offer being found to be bogus or the documents contain false particulars, they shall be blacklisted for future tenders/ association with ANERT and EMD shall be forfeited against any losses incurred by ANERT.

## **8. BIDDER'S LOCATION**

- 8.1 The tenderers are requested to furnish the exact location of their factories/godown with detailed postal address and pin code, telephone and fax nos. etc. in their tenders to arrange inspection by ANERT, if considered necessary.
- 8.2 All communication shall be made to the registered email of the bidder in the e-tendering systems and ANERT shall not be responsible for non-receipt or delay of any such communication.

## **9. CORRUPT AND FRAUDULENT PRACTICES**

ANERT requires compliance with its policy in regard to corrupt and fraudulent/prohibited practices as set forth in this proposal. In further pursuance of this policy, the selected service Provider(s) shall permit ANERT or its representatives to inspect the accounts, records and other documents relating to the submission of the

Proposal and execution of the contract, in case of award, and to have the records inspected by ANERT.

## **10. CONFLICT OF INTEREST**

- i. The service Provider(s) is required to provide professional, objective, and impartial services, at all times holding ANERT's interests paramount, strictly avoiding conflicts with other assignments or its own corporate interests, and acting without any consideration for future work. The supplier has an obligation to disclose to ANERT any situation of actual or potential conflict that impacts its capacity to serve the best interest of ANERT. Failure to disclose such situations may lead to the disqualification of the supplier or the termination of its Contract and/or sanctions by the Government.
- ii. Relationship with the ANERT staff: a service Provider (including its subsidiaries /partners) that has a close business or family relationship with a professional staff of the ANERT who are directly or indirectly involved in any part of the preparation of this document, the selection process for the Contract, or the supervision of the Contract, may not be awarded a Contract, unless the conflict stemming from this relationship has been resolved in a manner acceptable to ANERT throughout the selection process and the execution of the Contract. Any other types of conflicting relationships as indicated in the Tender

## **11. CONFIDENTIALITY**

- i. From the time the Proposals are opened to the time the Contract is awarded, the agency (ies) should not contact any of the officials of ANERT on any matter related to its Technical and/or Financial Proposal. Information relating to the evaluation of Proposals and award recommendations shall not be disclosed to the agency (ies) who submitted the Proposals or to any other party not officially concerned with the process, until the publication of the Contract award information.
- ii. Any attempt by the agency (ies) or anyone on behalf of the Suppliers to influence improperly ANERT in the evaluation of the Proposals or Contract award decisions may result in the rejection of its Proposal and may be subject to the application of prevailing Government sanctions procedures.

- iii. Notwithstanding the above provisions, from the time of the Proposals“ opening to the time of Contract award publication, if a agency (ies) intends to contact ANERT on any matter related to the selection process, it should do so only in writing.
- iv. The Bids should be submitted only through the e-tender portal [www.etenders.kerala.gov.in](http://www.etenders.kerala.gov.in). Agency (ies) shall upload all the necessary documents in the e tender portal before the last date & time for online submission. Proposal received after the submission deadline will be treated as non-responsive and will be excluded from further evaluation process.
- v. Proposals must be direct, concise, and complete. ANERT will evaluate bidder’s proposal based on its clarity and the directness of its response to the requirements of the project as outlined in this tender document. Bidders shall furnish the required information on their technical and financial proposals in the enclosed formats only. Any deviations in format or if the proper information is not provided properly, the tender will be liable for rejection. Tender Evaluation committee may seek clarification, if required, while evaluating the proposal.
- vi. The technical bid opening date, time and the address are as stated in the tender document. The Financial Proposal shall remain securely stored online till the technical evaluation is completed and the results intimated to all successful bidders

## **12. APPLICABLE LAW**

The work order shall be governed by the laws and procedures established by Government of Kerala, within the framework of applicable legislation and enactment made from time to time concerning such commercial dealings. Any default in the terms and conditions of the document by the service provider will lead to rejection of work order.

## **13. AMENDMENT OF TENDER DOCUMENT**

At any time prior to the deadline for submission of the tender, ANERT may for any reason, modify the tender document. The amendment document/ corrigendum shall be notified through the website [www.etenders.kerala.gov.in](http://www.etenders.kerala.gov.in) and such amendments shall be binding on all the bidders.

#### **14. COMMENCEMENT OF SERVICE**

The successful bidder should sign the contract agreement within 7 days of issue of work order. The successful bidder should start the services as defined in the scope of work within 15 days of Issue of work order.

#### **15. GOVERNMENT OF KERALA – CORRUPT AND FRAUDULENT PRACTICES**

ANERT follows the policy of the Government of Kerala for anti-corruption and fraudulent practices to maintain sound procurement principles of open competition, economy and efficiency, transparency, and fairness. ANERT requires the agency (ies) to observe the following Government manuals (amended from time-to-time) during the selection process and in execution of such contracts The Kerala Financial Code (KFC), 2008 (7th Edition, 1st Edition was in 1963), The Stores Purchase Manual (SPM), 2013.

## **BID QUALIFICATION REQUIREMENTS**

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### **16. BID QUALIFICATION REQUIREMENTS**

- a. Every tenderer should submit along with his e-tender an Earnest Money Deposit (EMD). This may be done electronically from any of the Nationalized/Schedule Banks. The EMD of the disqualified tenderers will be returned automatically through e-procurement system. The EMD of the successful tenderers may be adjusted towards the security deposit. No interest shall be paid for the earnest money deposited.
- b. An agreement in Rs.200/- Kerala stamp paper as per the format given in Annexure B must be submitted along with e-tender document.
- c. Only the Registered vendors of ANERT for SPV Power plants issued by ANERT from time to time are eligible for participation in the tender.
- d. The bidder must use PV modules listed in the ALMM list issued by MNRE from time to time. A detailed BoM in the letter head of the bidder is to be provided along with the bid.
- e. Price Bid in excel format, for this tender to be downloaded from e-tender website, duly digitally signed by the tenderer/authorized signatory of the tender.

## CONDITIONS OF CONTRACT

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### 17. GENERAL CONDITIONS

- 17.1 The tenders should be submitted online at [www.etenders.kerala.gov.in](http://www.etenders.kerala.gov.in)
- 17.2 The tenders should be as per the prescribed form which should be downloaded from the e-tender website.
- 17.3 Intending tenderers should submit their tenders on or before the due date and time mentioned in the tender abstract.
- 17.4 The rates quoted should be only in Indian currency. Tenders in any other currency are liable to rejection. The rates quoted should be for the unit specified in the schedule attached.
- 17.5 Tenders subject to conditions will not be considered. They are liable to be rejected on that sole ground.
- 17.6 The final acceptance/rejection of the tenders' rests entirely with CEO, ANERT who do not bind themselves to accept the lowest or any tender.
- 17.7 The successful tenderer should be prepared to guarantee satisfactory performance for a period of guarantee under a definite penalty. Communication of acceptance of the e-tender normally constitutes a concluded contract. Nevertheless, the successful tenderer shall also execute an agreement for the due fulfilment of the contract within the period to be specified in the letter of acceptance. The contractor shall have to pay all stamp duty, Lawyer's charges, and other expenses incidental to the execution of the agreement. Failure to execute the agreement within the period specified will entail the penalties set out below:
- a) A non-refundable licensing fee of 2.5% has to be remitted by tenderer. This will be deducted from the payment of tenderer while releasing payment. The successful tenderer shall sign an agreement with ANERT within the period specified in the letter of acceptance of this tender. The amount of stamp duty for the agreement must be in compliance with G.O.(P) No.113/2019/TD. dtd 24.07.2019 with respect to public works. They are to deposit a sum equivalent to 3% of the value of the contract as security for the satisfactory fulfilment of the contract less the amount of money deposited by him along with his tender.



The amount of security may be deposited in the manner prescribed to be specified in the work order issued by ANERT.

- b) There will be no exemption for MSE's in depositing this security amount. If the successful tenderer fails to deposit the security and execute the agreement as stated above, the earnest money deposited by him will be forfeited to ANERT and contract arranged elsewhere at the defaulter's risk and any loss incurred by ANERT on account of the purchase will be recovered from the defaulter who will however not be entitled to any gain accruing thereby.
- c) In cases where a successful tenderer, after having made partial works, fails to fulfil the contracts in full, all or any of the materials not supplied may at the discretion of the Purchasing Officer be purchased by means of another tender/quotation or by negotiation or from the next higher tenderer who had offered to supply already, and the loss if any caused to ANERT shall thereby together with such sums as may be fixed by ANERT towards damages be recovered from the defaulting tenderer.
- d) If the contractor fails to deliver all or any of the stores or perform the service within the time/period(s) specified in the contract, the purchaser shall without prejudice to its other remedies under the contract, deduct from the contract prices, as liquidated damages, a sum equivalent to 0.5 % of the delivered price of the delayed stores or unperformed services for each week of delay until actual delivery or performance, up to a maximum deduction of 10% of the contract price of the delayed stores and services. Once the maximum is reached, the purchaser may consider termination of the contract at the risk and cost of the contractor.

17.8 The Security deposit shall, subject to the conditions specified herein be returned to the contractor within three months after the expiration of the contract but in the event of any dispute arising between ANERT and the contractor, ANERT shall be entitled to deduct out of the deposits or the balance thereof, until such dispute is determined the amount of such damages, costs, charges and expenses as may be claimed. The same may also be deducted from any other sum which may be due at any time from ANERT to the contractor. In all cases where there are guarantee for

the goods supplied, the security deposit will be released only after the expiry of the guarantee period.

17.9 (a) All payments to the contractors will be made in due course by ANERT through NEFT payments

(b) All incidental expenses incurred by ANERT for making payments outside the State in which the claim arises shall be borne by the contractor.

17.10 Payments will be made only after the supply, Installation and Commissioning of the items and certification by the competent technical personnel of ANERT.

17.11 The contractor shall not assign or make over the contract on the benefits or burdens thereof to any other person or body corporate. The contractor shall not underlet or sublet to any person or persons or body corporate the execution of the contract or any part thereof without the consent in writing of the purchasing officer who shall have absolute power to refuse such consent or to rescind such consent (if given) at any time if he is not satisfied with the manner in which the contract is being executed and no allowance or compensation shall be made to the contractor or the subcontractor upon such rescission. Provided always that if such consent be given at any time, the contractor shall not be relieved from any obligation, duty, or responsibility under this contract.

17.12 In case the contractor becomes insolvent or goes into liquidation, or makes or proposes to make any assignment for the benefit of his creditors or proposes any composition with his creditors for the settlement of his debts, carries on his business or the contract under inspection or behalf of or his creditors or in case any receiving order(s) for the administration of his estate are made against him or in case the contractor shall commit any act of insolvency or in case in which under any clause or clauses any act of insolvency or in case in which under any clause(s) of this contract the contractor shall have rendered himself liable to damages amounting to the whole of his security deposits, the contract shall, thereupon, after notice given by the Purchasing Officer to the contractor, be determined and ANERT may complete the contract in such time and manner and by such persons as ANERT shall think fit. But such determination of the contract shall be without any prejudice to any right or remedy of ANERT against the contractor or his sureties in respect of any breach of contract committed by the contractor. All expenses and

damages caused to ANERT by any breach of contract by the contractor shall be paid by the contractor to ANERT and may be recovered from him under the provisions of the Revenue Recovery Act in force in the State.

17.13 In case the contractor fails to supply and deliver any of the said articles and things or the works within the time provided for delivery of the same, or in case the contractor commits any breach of any of the covenants, stipulations and agreements herein contained, and on his part to be observed and performed, then and in any such case, it shall be lawful for ANERT (if they shall think fit to do so) to arrange for the purchase of the said articles and things from elsewhere or on behalf of ANERT by an order in writing under *the* hand of the CEO put an end to this contract and in case ANERT shall have incurred sustained or been put to any costs, damages or expenses by reason of such purchase or by reason of this contract having been so put an end to or in case any difference in price, compensation, loss, costs, damages, expenses or other moneys shall then or any time during the continuance of this contract be payable by the contractor to ANERT under and by virtue of this contract, it shall be lawful for ANERT from and out of any moneys for the time being payable or owing to the contractor from ANERT under or by virtue of this contract or otherwise to pay and reimburse to ANERT all such costs, damages and expenses they may have sustained, incurred or been put to by reason of the purchase made elsewhere or by reason of this contract having been so put an end to as aforesaid and also all such difference in price, compensation, loss, costs, damages, expenses and other moneys as shall for the time being payable by the contractor aforesaid.

17.14 Any sum of money due and payable to the contractor (including security deposit returnable to him) under this contract may be appropriated by the CEO or any other person authorised by ANERT and set off against any claim of ANERT for the payment of a sum of money arising out of or under any other contract made by the contractor with ANERT or any other person authorised by ANERT. Any sum of money due and payable to the successful tenderer or contractor from ANERT shall be adjusted against any sum of money due to ANERT from him under any other contracts.

- 17.15 Every notice hereby required or authorised to be given may be either given to the contractor personally or left at his residence or last known place of abode or business, or may be handed over to his agent personally, or may be addressed to the contractor by post at his usual or last known place of abode or business and if so addressed and posted, shall be deemed to have been served on the contractor on the date on which in the ordinary course of post, a letter so addressed and posted would reach his place of abode or business.
- 17.16 The tenderer shall undertake the installation and commissioning of the system according to the standards and specification.
- 17.17 No representation for enhancement of rate once accepted will be considered.
- 17.18 The prices quoted should be inclusive of GST and all other expenses which are or may become payable by the contractor under existing or future laws or rules of the country of origin/supply or delivery during execution of the contract.
- 17.19 Special conditions, if any, of the tenderers attached with the tenders will not be applicable to the contract unless they are expressly accepted in writing by the purchaser.
- 17.20 The tenderer should send along with this tender an agreement executed and signed in Kerala Stamp Paper of value Rs.200/-. A specimen form of agreement is given as Annexure B to this tender. Tenders without the agreement in stamped paper will be rejected outright.
- 17.21 **Conditions in the technical document, technical specifications and special conditions of this tender document would override these general conditions, wherever applicable.**
- 17.22 ANERT, by notice sent to the Supplier, may terminate the contract, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination is for ANERT's convenience, the extent to which performance of the Supplier under the contract is terminated, and the date upon which such termination becomes effective.
- 17.23 The installation must be done at the highest standard as the project is undertaken by ANERT to showcase the best practices in the Solar industry. Use of sub-standard materials and installation practices will not be tolerated, and stringent actions will be imposed including debarring from future works etc.

- 17.24 It is mandatory to provide the drawings mentioned in the tender along with detailed BoM before the dispatch of materials to site. ANERT reserves the right to reject the materials if the same are not in compliance with the requirements of the tender. In case, the successful bidder delivers the materials without BoM approval, they may have to take back the materials at their own cost and no time extension without penalty will be provided for completion of works.
- 17.25 E-tender shall be opened at the time and date announced in the tender notice, and the price bid will be evaluated on the same day.
- 17.26 In case any difference or dispute arises in connection with the contract, all legal proceedings relating to the matter shall be instituted in the Court within whose jurisdiction the CEO, ANERT voluntarily resides.
- 17.27 The Courts situated at the place where the headquarters of ANERT is situated viz, Thiruvananthapuram alone will have jurisdiction to entertain civil suits and all other legal pertaining to this contract.

## **18. SPECIAL CONDITIONS**

- 18.1 Each bidder should submit only one (1) bid. Any bidder who submits/participates in more than one bid for the work shall be disqualified.
- 18.2 The tenders will be opened in the presence of bidders present at the date and time advised in the Bidding Document. If the due date for receiving and opening the tender happens to be declared holiday, then the tender will be received and opened on the very next day, for which no prior intimation will be given.
- 18.3 If the price bid is not submitted along with the tender, such tenders will be summarily rejected.
- 18.4 **During the tender evaluation, ANERT may seek more clarifications/details from any or all the tenderers, if felt necessary.**
- 18.5 The price bids of the tenderers, which submitted the required documents only will be opened and the L1 bidder will be awarded the work of supply and installation of items after fulfilling all the requirements.
- 18.6 **ANERT reserves the right, in the interest of completion of work within the time limit, to award portion/portions of the Work order to next higher bidders, called for negotiation in the increasing order of their price offers.**

- 18.7 **The rate quoted should be all inclusive including delivery of materials at the locations to be specified, and the cost of materials and labour for the civil works, installation and commissioning, warranties, fee for approval from the Electrical Inspectorate if any, Fee for KSEBL Feasibility application and registration fee along with GST and all other expenses.**
- 18.8 **The price quotes should be inclusive of initial cost of supply, installation and commissioning, support during the warranty period of 10-years.**
- 18.9 The tender offer shall be kept valid for acceptance for a period of 1 month from the date of opening of bid. The offers with lower validity period are liable for rejection.
- 18.10 The evaluation of the price bid will be based on the grand total of all-inclusive amount quoted excluding GST.



**AGENCY FOR NEW & RENEWABLE ENERGY  
RESEARCH AND TECHNOLOGY (ANERT)**

Department of Power, Government of Kerala  
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## **E-TENDER DOCUMENT**

*Retender for the Repair and Reconditioning  
of 25 kWp Off Grid Solar Power plant at  
Puravayal Tribal Hamlet, Marayoor, Idukki*

**Ref. No.: ANERT-IDK/5/2022-DE(IDK)**

### **PART – 2: SCOPE OF WORKS**

**Date of Publishing of Bids** : - **01/01/2024**

**Last Date of Submission of Bids** : - **12/01/2024**

## SCOPE

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### 19. INVITATION TO BID

- 20.1 **ANERT is the State Agency for Renewable Energy in Kerala** having its Headquarters at Thiruvananthapuram, Kerala, and various district level offices **This tender has been issued by the ANERT for the selection of agency for the Repair and Reconditioning of the existing standalone off grid Solar Power Plants with 5-year warranty at Puravayal Tribal Hamlet, Marayur, Idukki.**
- 20.2 To meet the requirements, ANERT proposes to invite bids from ANERT registered vendors for Solar Power Plant to provide services as per details/**scope of work** mentioned in this tender document.
- 20.3 Bidder shall mean any entity (i.e. juristic person) who meets the **eligibility criteria** of this tender and willing to provide the Services as required in this bidding document. The interested Bidders who agree to all the terms and conditions contained in this document may submit their Bids with the information desired in this bidding document.
- 20.4 Address for submission of Bids, contact details including email address for sending communications are given in this tender document.
- 20.5 This document shall not be transferred, reproduced, or otherwise used for purpose other than for which it is specifically issued.
- 20.6 Interested Bidders are advised to go through the entire document before submission of Bids to avoid any chance of elimination. The eligible Bidders desirous of providing services to ANERT are invited to submit their technical proposal in response to this tender. The criteria and the actual process of evaluation of the responses to this tender and the selection of Bidder will be entirely at ANERT's discretion. This tender seeks proposal from Bidders who have the necessary experience, capability & expertise to provide ANERT the proposed Services adhering to its requirements outlined in this tender.



## 20. SCOPE OF WORK

- 20.1 The Scope of works include the Repairing and Reconditioning of the existing 25kWp standalone off grid Solar Power Plant, Replacement of inverters and 1 set of Battery bank, DBs, Cables etc.
- 20.2 The scope also covers the reconditioning works of the SPV Power Plant including Supply of materials viz Off Grid / Hybrid Inverter of Capacity 25kW, Battery bank of 37.8 kWh, Balance of Systems including DCDBs, ACDBs, installation and commissioning of the system based on the conditions and specification incorporated in the tender.
- 20.3 The bidder shall supply 2 Nos of 25 kW Solar Off Grid / Standalone inverters capable of working in parallel with capacity to share load among them. Supply of Lead Acid Tubular battery (2V or 12V) having a minimum capacity of 38 kWh.
- 20.4 Decommissioning of the existing off grid system and one set of damaged batteries (30 Nos of 12V, 105AH) is under the scope of the bidder.
- 20.5 The bidder must replace the existing 25kW off grid inverter with these two 25 kW inverters, such that they work in parallel and in case, any one of them fails, the other inverter must isolate the faulty one and power the complete load by itself.
- 20.6 The installation of MCBs in all households which will act as current limiting device for max load of 500W may be installed in the existing DB of houses.
- 20.7 The buy back of existing battery bank (12 V, 105 AH, make – Firefly, 60 Nos), and Solar Inverter – 25 kW (developed by CDAC(T) as R&D project) are under the scope of the bidder. The costs quoted for buyback by the bidder will be deducted from the work order being issued to them.
- 20.8 Fresh Earthing and Lightning protection to be provided after removing the existing lightning rods and earthing wires. The existing earth pits can be used if required or fresh earth pits are to be created if the earth resistance is beyond allowable limits.
- 20.9 Lightning arrestor should be installed for the PV arrays as per necessary standards with proper earthing if the existing accessories are inadequate.
- 20.10 It is mandatory that the bidders are to visit the sites and quote the rates considering all the requirements as mentioned in this tender document. No requests for revision of rates will be entertained. In case, the successful bidder is

not undertaking the specific work, the work will be cancelled, and disciplinary proceedings will be initiated against the bidder and all payments due will be withheld. Hence, Bidders are requested to visit the site before quoting and the rate for successful commissioning in all aspects is to be quoted.

- 20.11 **The rate quoted should be all inclusive including delivery of materials, the cost of materials and labour for the civil works, Installation and Commissioning, 5-year Warranty for all materials supplied by the bidder and for workmanship, Solar Meter, Remote monitoring facility, Insurance, GST and all other expenses deemed necessary for the proper implementation of the conditions and specification in-corporated in the tender.**
- 20.12 The Component wise split up of the costs in percentage for each capacity is to be included as part of the technical bid (included as format A).
- 20.13 Any other work required for the successful commissioning of the power plant which are not mentioned in this document and are required as per prevailing laws & regulations in the country.

## **21. SCHEDULE OF SUPPLY & INSTALLATION**

- 21.1 The items should be delivered and installed at the sites of institution for which work order shall be given and specified by ANERT, under prior intimation and supervision of ANERT.
- 21.2 The Decommissioning of the Power plants must be done within 7 days from the date of issue of work order. The supply of inverters, New battery bank etc must be completed within 21 days and the reinstallation must be completed within 30 days from the date of issue of work order.
- 21.3 For any delay in Installation and Commissioning beyond the period mentioned above, the ANERT will charge penalty of 0.5% of the order value/week or part thereof, subject to the cost not exceeding 10% of the total cost.
- 21.4 Order will be cancelled if the delay of service is more than this time period and work will be issued to the second successful bidder.
- 21.5 Bidders are to submit their quotes only after visiting the site and the details of additional works required for the successful commissioning of the power plant is

to be mentioned in the technical bid. No additional amount for any works will be provided under any circumstance, even if the site requires additional work other than quoted by the bidder. Hence, special care must be taken while submitting the bids.

21.6 The successful bidder shall submit the detailed BoM and the timeline for completion along with the agreement and security deposit. This timeline must be followed and no extension of time for completing the installation will be granted. Although, time extension may be granted for things beyond the control of the bidder.

21.7 In case of no valid reason, extension of time of completion that can be granted at a time shall will be 25% of the original time. The maximum extension that can be granted for a work shall be limited to half the original time of completion.

21.8 When the contract period has to be extended wholly or partly due to default on the part of the bidder, the Agreement Authority may sanction extension of time after imposing fine as mentioned below;

<b>Period</b>	<b>Rate of Fine</b>
First Extension	1% of the PAC subject to a minimum of Rs. 1000/- and maximum of Rs. 50,000/-.
Second Extension	2% of the PAC subject to a minimum of Rs. 2000/- and maximum of Rs. 1,00,000/-

## **22. PAYMENT**

22.1 No advance payment will be given. All the documents submitted should be certified by the concerned District Office of ANERT.

22.2 The quotes for the Design, Supply, Installation & Commissioning including 5 years of warranty for the items supplied by the bidders.

22.3 The terms of payment shall be:

- i. 2.5 % of the invoice amount shall be charged by ANERT as non-refundable license fee and the remaining amount shall be treated as contract value for further payment.
- ii. Upon delivery of major components (Inverter, Battery etc), 60 % of the contract value will be released as first part payment. The supplier shall submit the invoice for the materials (including serial numbers and delivery chalan)

duly certified by the concerned District Office along with a report regarding the supply of materials.

- iii. On completion of the installation and commissioning of the power plant, 30% of the contract value shall be released as second part payment. The supplier shall submit the invoice for the materials supplied and all documents related including the Project Completion Report to the completion of the work certified by the district office shall be submitted for the release of the amount. The PCR submitted will be used for conducting the pre-commissioning tests.
- iv. The balance 10% shall be retained as performance security and will be released in parts - 2% after each year of completion of warranty period, till the fifth year. This period will be considered only from the date of commissioning.
- v. The security deposit of 3% furnished along with the contract agreement shall be released on successful completion of supply, installation and commissioning.

22.4 Income tax, contribution to workers' welfare fund and other statutory deductions shall be made from the payment as per prevailing norms.

## **23. SERVICE AND MAINTENANCE**

- 23.1 The faulty system or components should be replaced/ repaired within 5 days of fault reporting. The servicing should be carried out at the site of installation.
- 23.2 The service personnel should visit the installations at least once in 6 months for preventive maintenance even if no faults are reported. **Reports of these preventive maintenance (Format attached as Annexure - E) visits and generation data should be submitted to the concerned ANERT District Offices on a quarterly basis.**
- 23.3 Any Delay in servicing beyond 10 days of fault reporting would attract penalty at the rate of at the rate fixed by CEO, ANERT and further actions will be initiated against the agency.
- 23.4 A designated contact Telephone Number and address should be submitted for reporting faults during the warranty period.

## 24. SYSTEM COMPONENTS - TECHNICAL COMPLIANCE FOR SYSTEM COMPONENTS

S/N	System Component	Capacity/ rating	Minimum Technical Compliance
1.	Hybrid Inverter	2 x 25 kW	IS 16221: Part 1 & 2 - Safety of Power Converters for use in Photovoltaic Power Systems IS 16169 - Test Procedure of Islanding Prevention Measures for Utility-Interconnected Photovoltaic Inverters
2.	Battery Bank	12 V, 38 kWh	IEC 61427-1:2013 - Secondary cells and batteries for renewable energy storage – General requirements and methods of test - Part 1: Photovoltaic off-grid application IS 13369:1992 - Stationary lead - Acid batteries (With Tubular Positive Plates) in monobloc container - Specification IS 1651:2013 - Stationary cells and batteries, lead - Acid type (With Tubular Positive Plates) - Specification (Fourth Revision)
3.	Cables	As required	IEC 60227 / IS 694 IEC 60502 / IS 1554 (Pt. I & II)
4.	Switches/ Circuit Breakers	As required	IEC 60947 part I, II, III / IS 60947 Part I, II, III
5.	Connectors		EN 50521
6.	Surge Protection Device		IEC 60364-5-53 / IS 15086-5
7.	Junction Boxes/Enclosures for Inverters/ Charge Controllers	As required	IP 54 (for outdoor) or IP 65 / IP 21(for indoor) as per IEC 529
8.	Energy Meter for Recording Solar Electricity Generated & Two-way meter for Distribution Licensee grid connection		As per CEA Regulations; IEC 60687/ IEC 62052-11 / IEC 62053-22 / IS 14697
9.	Lightning Protection	As required	As per IEC 62305 / IEC 62561
10.	Electrical Grounding (Earthing)	As required	As per IS 3043

## **25. STANDARDS AND REGULATIONS TO BE COMPLIED**

The connectivity should be as per

- a. Technical Standards for connectivity of the Distributed generation resources, Regulation, 2013.
- b. CEA Regulation 2010 has to be followed safety and Electricity supply.
- c. Metering should be as per CEA regulation 2006.
- d. Any amendments thereof will also be applicable.

## **26. POWER CONDITIONING UNIT (PCU)**

The Power Conditioning Unit (inverter) comprises of charge controller with MPPT technology that is either integrated with the inverter or as a separate unit. The specifications for the OFF-Grid inverter is detailed below:

### **26.1 General Specifications:**

All the Inverters should contain the following clear and indelible Marking Label & Warning Label as per IS16221 Part II, clause 5. The equipment shall, as a minimum, be permanently marked with:

- i. The name or trademark of the manufacturer or supplier.
- ii. A model number, name or other means to identify the equipment.
- ii. A serial number, code or other markings allowing identification of manufacturing location and the manufacturing batch or date within a three-month time period.
- iii. Input voltage, type of voltage (A.C. or D.C.), frequency, and maximum continuous current for each input.
- iv. Output voltage, type of voltage (A.C. or D.C.), frequency, maximum continuous current, and for A.C. outputs, either the power or power factor for each output.
- v. The Ingress Protection (IP) rating

- 26.2 The control system should continuously adjust the voltage of the generator to optimize the power available. The power conditioner must automatically re-enter standby mode when input power reduces below the standby mode threshold. Front Panel display should provide the status and fault indication (if any)

- 26.3 The inverter should have IGBT/MOSFET based controlling elements and current regulated systems.
- 26.4 Operational Voltage Range: Suitable System Voltage according to the battery bank and panel array
- 26.5 The inverter must have MPPT power electronics for the maximum extraction of PV power
- 26.6 The inverter shall provide electronic protection against the following type of faults:
- a. Overload
  - b. Over temperature
  - c. Reverse polarity
  - d. Short circuit (circuit breaker & electronic protection against sustained fault).
  - e. Over-load protection.
  - f. Under voltage & Over-voltage of Battery.
  - g. Auto/ Manual re-connects provision. h. Reverse polarity protection both for the PV array and Battery bank (DC)
- 26.7 Auto resetting electronic over current protection
- 26.8 The inverter must have a RS485/RS232 interface
- 26.9 The inverter shall conform to IEC 61683/ IS 61683 for efficiency measurement, and IEC 60068-2 (1,2,14,30) or equivalent BIS standard for environmental testing.
- 26.10 Operational Voltage Range: Suitable System Voltage according to the battery bank and panel array
- 26.11 Type: Self commuted, current regulated, IGBT/ MOSFET based.
- 26.12 Output voltage: Output voltage 230V/415V
- 26.13 Output frequency :50 Hz
- 26.14 THD: Less than (<) 5%
- 26.15 Efficiency: 90% or above at full load.
- 26.16 Ambient temperature: 5 to 55°C
- 26.17 Protections:
- a. Short circuit (circuit breaker & electronic protection against sustained fault)
  - b. Over-load protection

- c. Under voltage & Over-voltage of Battery
- d. Auto/Manual re-connect provision
- e. Reverse polarity protection both for the PV array and Battery bank (DC)
- f. Ingress Protections: IP20/ IP 21 or above

26.18 Other Features:

- a. Surge Protection: 150% of the rated capacity for a period of 10 seconds
- b. Acoustic Noise Level  $\leq$  50 dB

26.19 Recommended Indicators / Displays / Alarms

- a. Digital Display(s) of input DC SPV voltage & current, along with Energy Meter
- b. Digital Display (s) AC output voltage, frequency, power and current
- c. Digital Display of output AC kWh meter (Daily/ Cumulative)
- d. Overload Alarm / cut-off
- e. System Cut-off Indicator
- f. System Reset Button.
- g. Battery voltage and current.
- h. SPV charging.
- i. Battery Charge Level LED Indicator (s) – Low, Medium, High, Full. j. Battery Low indicator and Alarm/ cut-off.

## 27. BATTERY BANK

Battery Bank (38000 Wh Lead Acid Tubular Battery)

Batteries shall comply with the specified edition of the following standards and codes.

Standard	Description
IEC 61427-1:2013	Secondary cells and batteries for renewable energy storage – General requirements and methods of test - Part 1: Photovoltaic off-grid application
IS 13369:1992	Stationary lead - Acid batteries (With Tubular Positive Plates) in monobloc container - Specification
IS 1651:2013	Stationary cells and batteries, lead - Acid type (With Tubular Positive Plates) - Specification (Fourth Revision)



## **28. ELECTRICAL SAFETY, EARTHING AND PROTECTION**

- a. Internal Faults: In built protection for internal faults including excess temperature, commutation failure, over load and cooling fan failure (if fitted) is obligatory.
- b. Over Voltage Protection: Over Voltage Protection against atmospheric lightning discharge to the PV array is required. Protection is to be provided against voltage fluctuations in the grid itself and internal faults in the power conditioner, operational errors and switching transients.
- c. Earth fault supervision: An integrated earth fault device shall have to be provided to detect eventual earth fault on DC side and shall send message to the supervisory system.

## **29. CABLING PRACTICE**

Cable Cabling is required for wiring from AC output of inverter/PCU to the Grid Interconnection point. It includes the DC cabling from Solar Array to AJB and from AJB to inverter input.

- 29.1 All cables of appropriate size to be used in the system shall have the following characteristic:
  - a. Shall conform to IEC 60227 / IS 694 & IEC 60502 / IS 1554 standards.
  - b. Temperature Range: -10 degree Celsius to +80 degree Celsius
  - c. Voltage rating: 660/1000V
  - d. Excellent resistance to heat, cold, water, oil, abrasion, UV radiation
  - e. Flexible
- 29.2 Sizes of cables between any array interconnections, array to junction boxes, junction boxes to inverter etc. shall be so selected to keep the voltage drop (power loss) of the entire solar system to the minimum (2%).
- 29.3 For the DC cabling, XLPE or XLPO insulated and sheathed, UV stabilized single core flexible copper cables shall be used; multi-core cables shall not be used.
- 29.4 For the AC cabling, PVC or XLPE insulated and PVC sheathed single or, multi-core flexible copper cables shall be used. However, for above 10kWp systems, XLPE insulated Aluminium cable of suitable area of cross section can be used in the AC side subject to a minimum area of cross section of 10 sq.mm. Outdoor AC cables shall have a UV -stabilized outer sheath IS/IEC 69947.

- 29.5 All LT XLPE cables shall conform to IS:7098 part I&II.
- 29.6 The total voltage drop on the cable segments from the solar PV modules to the solar grid inverter shall not exceed 2.0%
- 29.7 The total voltage drop on the cable segments from the solar inverter to the building distribution board shall not exceed 2.0%
- 29.8 The DC cables from the SPV module array shall run through a UV-stabilized PVC conduit pipe of adequate diameter with a minimum wall thickness of 1.5mm
- 29.9 Cables and wires used for the interconnection of solar PV modules shall be provided with solar PV connectors (MC4) and couplers
- 29.10 All cables and conduit pipes shall be clamped to the rooftop, walls and ceilings with thermo-plastic clamps at intervals not exceeding 50cm; the minimum DC cables size shall be 4.0mm<sup>2</sup> copper; the minimum AC cable size shall be 4.0mm<sup>2</sup> copper. In three phase systems, the size of the neutral wire size shall be equal to the size of the phase wires. Conduits for taking outdoor cables shall be UV treated.
- 29.11 Cable Marking: All cable/wires are to be marked in proper manner by good quality ferule or by other means so that the cable can be easily identified. The following colour code shall be used for cable wires
- a. DC positive: red (the outer PVC sheath can be black with a red line marking)
  - b. DC negative: black
  - c. AC single phase: Phase: red; Neutral: black
  - d. AC three phase: phases: red, yellow, blue; neutral: black
  - e. Earth wires: green
- 29.12 Cables and conduits that have to pass through walls or ceilings shall be taken through PVC pipe sleeve.
- 29.13 Cable conductors shall be terminated with tinned copper end ferrules to prevent fraying and breaking of individual wire strands. The termination of the DC and AC cables at the Solar Inverter shall be done as per instructions of the manufacturer, which in most cases will include the use of special connectors.
- 29.14 All cables and connectors used for installation of solar field must be of solar grade which can withstand harsh environment conditions including high temperatures, UV radiation, rain, humidity, dirt, salt, burial and attack by moss and microbes for 25 years and voltages as per latest IEC standards. DC cables used from solar

modules to array junction box shall solar grade copper (Cu) with XLPO insulation and rated for 1.1 kV as per relevant standards only.

29.15 Bending radii for cables shall be as per manufactures recommendations and IS: 1255.

29.16 For laying/termination of cables latest BIS/IEC Codes/ standards shall be followed.

### **30. FACTORY TESTING**

- a. PCU shall be tested prior to shipment and factory test certificate for relevant parameters should be provided with the PCU supplied. ANERT or authorised representative of ANERT may be allowed to witness the tests if required.
- b. Factory testing shall not only be limited to measurement of phase currents, efficiencies, harmonic content and power factor, but shall also include all other necessary tests/simulation required and requested by the Purchasers Engineers. Tests may be performed at 25, 50, 75 and 100 percent of the rated nominal power.

### **31 SURGE PROTECTION**

The system should have installed with Surge Protection Device (SPD) for higher withstand of the continuous PV-DC voltage during earth fault condition. SPD shall have safe disconnection and short circuit interruption arrangements through integrated DC in-built bypass fuse (parallel) which should get tripped driving failure mode of MOV, extinguishing DC arc safely in order to protect the installation against fire hazards. The SPD should be provided in the AC Distribution Box as well.

### **32 EARTHING**

The Solar PV Plant should have a dedicated earthing system. The Earthing for array and LT power shall be made as per the provisions of **IS:3043-2018** "Code of practice for earthing (Second Revision)," that governs the earthing practices of a PV system and **IS 732:2019** "Code of practice for electrical wiring installations (Fourth Revision)

32.1 Earthing System shall connect all non -current carrying metal receptacles, electrical boxes, appliance frames, chassis and PV module mounting structures in

one long run. The earth strips should not be bolted. Earthing GI strips shall be interconnected by proper welding.

- 32.2 The earthing conductor should be rated for 1.56 times the maximum short circuit current of the PV array. The factor 1.56 considers 25 percent as a safety factor and 25 percent as albedo factor to protect from any unaccounted external reflection onto the PV modules increasing its current
- 32.3 In any case, the cross-section area of the earthing conductor for PV equipment should not be less than 6 mm<sup>2</sup> if copper, 10 mm<sup>2</sup> if aluminium or 70 mm<sup>2</sup> if hot-dipped galvanized iron. For the earthing of lightning arrestor, cross-section of the earthing conductor should not be less than 16 mm<sup>2</sup> of copper or 70 mm<sup>2</sup> if hot-dipped galvanized iron. The minimum length of the earth electrode must be in compliance with the National Building Code of India 2016. The complete Earthing system shall be mechanically & electrically connected to provide independent return to earth.
- 32.4 Masonry enclosure with the earth pit of size not less than 400mm X 400 mm(depth) complete with cemented brick work (1:6) of minimum 150mm width duly plastered with cement mortar (inside) shall be provided. Hinged inspection covers of size not less than 300mm X 300mm with locking arrangement shall be provided. Suitable handle shall be provided on the cover by means of welding a rod on top of the cover for future maintenance.
- 32.5 Minimum required gap shall be provided in between earth pits as per relevant standard. Body earthing shall be provided in inverter, each panel frame, module mounting structure, kiosk and in any other item as required.
- 32.6 Earth pit shall be constructed as per IS: 3043-2018. Electrodes shall be embedded below permanent moisture level. Earth pits shall be treated with salt and charcoal if average resistance of soil is more than 20-ohm meter.
- 32.7 Earth resistance shall not be more than 5 ohms. Earthing system must be interconnected through GI strip to arrive equipotential bonding. The size of the GI earth strip must be minimum 25mm X 6mm
- 32.8 In compliance to Rule 11& 61 Of Indian Electricity Rules,1956(as amended up to date), all non-current carrying metal parts shall be Earthing with two separate and distinct earth continuity conductors to an efficient earth electrode.

- 32.9 The equipment grounding wire shall be connected to earth strip by proper fixing arrangement. Each strip shall be continued up to at least 500mm from the equipment.
- 32.10 Necessary provisions shall be made for bolted isolating joints of each earthing pit for periodic checking of earth resistance.
- 32.11 For each earth pit, a necessary test point shall be provided.
- 32.12 Total no of Earth pits required for solar plants shall be as per the Electrical Inspectorate norms.

### **33 LIGHTNING PROTECTION FOR PV ARRAY**

The SPV power plant should be provided with lightning and over voltage protection. The source of over voltage can be lightning or other atmospheric disturbance. The lightning conductors shall be made as per applicable Indian Standards in order to protect the entire array yard from lightning stroke.

The design and specification shall conform to IS/IEC 62305, "Protection against lightning" govern all lightning protection-related practices of a PV system.

- The entire space occupying SPV array shall be suitably protected against lightning by deploying required number of lightning arresters. Lightning protection should be provided as per IS/ IEC 62305.
- Lightning system shall comprise of air terminations, down conductors, test links, earth electrode etc. as per approved drawings.
- The protection against induced high voltages shall be provided by the use of surge protection devices (SPDs) and the earthing terminal of the SPD shall be connected to the earth through the earthing system.
- The Vendor / Company shall submit the drawings and detailed specifications of the PV array lightning protection equipment to Employer for approval before installation of system.

### **34 AC DISTRIBUTION PANEL BOARD**

- a. AC Distribution Board (ACDB) shall control the AC power from inverter and should have necessary surge arrestors.

- b. An ACDB panel shall be provided in between PCU and load. It shall have MCB/MCCB/ACB or circuit breaker of suitable rating for connection and disconnection of PCU from load.
- c. The connection between ACDB and load shall be of standard cable/ Conductor with suitable termination. It shall have provision to measure voltage, current and power.
- d. The incomer shall be selected at required rating. The ACDB enclosure shall be of good protection and suitable for mounting on the trenches / on wall.
- e. All the 415 V AC or 230 V AC devices/equipment like bus support insulators, circuit breakers, SFU isolators (if applicable), SPD, etc. mounted inside the switch gear shall be suitable for continuous operation
- f. Switches/ circuit breakers/ connectors meeting general requirements and safety measurements as per IS 60947 Part I, II, III and IEC 60947 part I, II and III.
- g. Junction boxes, enclosures, panels for inverters/ Controllers shall meet IP 65 (for indoor) as per IEC 529.

### **35 DC DISTRIBUTION BOARD**

- a. DC bus/ cable which can handle the current and the voltage of inverter output safely with necessary surge arrester as per the relevant IS standards.
- b. DC panel should be equipped with an adequate capacity indoor DC circuit breaker along with control circuit, protection relays, fuses, annunciators and remote operating and controlling facility from the main control facility.
- c. DCDB shall have sheet from enclosure of dust and vermin proof, the busbar/ cables are to be made of copper of desired size. DCDB shall be fabricated to comply with IP 65 protection.

### **36 CABLES, SWITCHES AND GENERAL REQUIREMENTS**

- a. PVC insulated copper cables with current rating suitable for AC and DC as per the National Electric Code, and meeting:
  - i. General Test and Measuring Method as per IEC 60189/ IS 694
  - ii. PVC insulated cables for working voltages up to 1100 V and UV resistant for outdoor installation as per IEC 60502/ IS 1554 (Pt. I & II)

- b. Cable Marking: All cable/wires are to be marked in proper manner by good quality ferule or by other means so that the cable can be easily identified.
- c. Switches/ circuit breakers/ connectors meeting general requirements and safety measurements as per IS 60947 Part I, II, III and EN 50521 for AC/DC.
- d. Junction boxes, enclosures for inverters/ charge controllers shall meet IP 54 (for outdoor)/ IP 21 (for indoor) as per IEC 529.

### 37 AC/DC WIRING

Before submitting the tender, actual measurement of cables required for wiring from AC output of inverter/PCU to load point should be calculated and this work is also included in the tender. The actual cable required from module to DC distribution board and DC distribution board to inverter input should be calculated and this work should be done as a part of Solar Power Plant installation. Separate drawings for exclusively for the AC/DC Wiring should be provided.

### 38 WARRANTY

- a. 5 years' warranty should be provided by the supplier for the system and components or part of the system has to be provided as per the special conditions of the contract.
- b. The Warranty Card to be supplied with the system must contain the details of the all the components supplied including serial numbers accompanied with the OEM warranty card

### 39. BILL OF MATERIAL

The bidder should provide the bill of material mentioning the quantity of each of the item consisting in the system, along with the offer in the format as show below for each capacity:

SN	Item	Make (If any)	Model & Individual Capacity (If any)	Qty (Nos)	Rating / Capacity
1.	Battery				
2.	PCU/Inverter				
3.	DC Cables				

4.	AC Cables				
5.	AJB/SCB				
6.	Module Mounting Structure (MMS)				
7.	ACDB				
8.	Lightning Arrester				
9.	Earthing System Details and No. of Earth pits				

#### 40. SITE INSPECTON

It is recommended that the bidders visit all the sites listed here for the physical verification and for correctly estimating the quantity, especially related to structure and cabling, before submitting the bids. **Bidder must include all the AC/DC wiring cost, replacement of instrument transformers, panel boards etc only after visiting the proposed site. The quoted amount will be for all the site-specific works and no additional amount will be allotted for any sort of works.**

#### 41. INSURANCE

- a. The power plant must be insured at every stage of operation – from Material dispatch, storage, completion of installation and till 5 years after commissioning. The insurance coverage on handing over of the system must include all conditions of **Standard Fire and Special Perils Policy (Material Damage)**.
- b. The insurance premium for the 5 years of warranty is to be paid by the bidder. Only the system components are to be insured. On handing over of the system, the original insurance policy is to be handed over to the authorised person at the site of installation and a copy to ANERT District Office. The annual premium payment receipt must be handed to the authorised person at the site of installation.



## FORMAT FOR COVERING LETTER

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*(This letter to be submitted on the official letter head of the tenderer, signed by the authorised signatory.)*

Sir,

I/We hereby e-tender to supply, under annexed terms and conditions of contract, the whole of the articles referred to and described in the attached specification and quantity decided by the Agency for New & Renewable Energy Research and Technology (ANERT), at the rates quoted against each item.

I am/We are remitting herewith the required amount of Rs. .... towards the cost of e-tender and Earnest Money Deposit by electronic payment vide transaction No ..... dtd.....

Yours faithfully,

Place:

Signature

Date:

Name

Designation

(Office Seal)

## ANNEXURE A – SUMMARY OF BID QUALIFICATION REQUIREMENTS

(To be filled in by the bidder)

1.	Name of the bidder	
2.	Address in full	
3.	Contact Details Mobile : Land Phone Fax Email	
4.	Name and Designation of the authorised signatory	
5.	Whether the bidder is a bonafide manufacturer/ integrator of the item tendered (Yes/No)?	
6.	Details of EMD submitted along with the bid in favour of CEO ANERT	
7.	Whether Bidder was/is De-barred by ANERT (Yes/No)? If ' Yes' period of De-Barring:	
8.	Agreement submitted (Yes/ No)?	

Documentary evidence for the bid qualification requirements are submitted along with this document and the details furnished above are true and correct.

Signature  
of authorised signatory

Name

Designation

Date:

(office seal)

## ANNEXURE B - AGREEMENT

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ARTICLES OF AGREEMENT executed on this the ..... day of .....  
Two thousand and .....between the **Agency for  
New & Renewable Energy Research and Technology** (hereinafter referred to as  
**ANERT**) of the one part and Sri .....  
(Name and Address of the tenderer) hereinafter referred to as “the Bounden”) of the other  
part.

WHEREAS in response to the Notification No. ....  
dated ..... the bounden has submitted to ANERT a e-tender for the ***Retender for  
the Repair and Reconditioning of 25 kWp Off Grid Solar Power plant at Puravayal  
Tribal Hamlet, Marayoor, Idukki*** specified therein subject to the terms and conditions  
contained in the said e-tender.

AND WHEREAS the bounden has furnished to ANERT a sum of Rs. .... as  
Earnest Money Deposit for execution of an agreement undertaking the due fulfilment of  
the contract in case his e-tender is accepted by ANERT. NOW THESE PRESENTS WITNESS  
and it is hereby mutually agreed as follows: -

In case the e-tender submitted by the bounden is accepted by ANERT and the contract  
for ..... is  
awarded to the bounden, the bounden shall within seven days of acceptance of this e-  
tender, execute an agreement with ANERT incorporating all the terms and conditions  
under which ANERT accepts this e-tender. The bounden have visited all the sites as  
mentioned in the tender document and the rates quoted are in accordance with all the  
terms and conditions mentioned in the tender documents and corrigenda issued  
thereafter;

In case the bounden fails to execute the agreement as aforesaid incorporating the terms  
and conditions governing the contract, ANERT shall have power and authority to recover

from the bounden any loss or damage caused to ANERT by such breach as may be determined by ANERT by appropriating the moneys inclusive of Earnest Money deposited by the bounden and if the Earnest Money is found to be inadequate the deficit amount may be recovered from the bounden and his properties movable and immovable in the manner hereinafter contained.

All sums found due to ANERT under or by virtue of this agreement shall be recoverable from the bounden and his properties movable and immovable under the provisions of the Revenue Recovery Act for the time being in force as though such sums are arrears of land revenue and in such other manner as ANERT may deem fit.

In witness whereof Sri ..... (Name and Designation) for and on behalf of the Agency for New & Renewable Energy Research & Technology and Sri ..... the bounden have hereunto set their hands the day and year shown against their respective signature.

Signed by Sri ..... Signed by Sri .....

(Date) ..... (Date) .....

in the presence of witnesses in the presence of witnesses

1. 1.

2. 2.

## **ANNEXURE C – DECLARATION BY THE BIDDER**

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e-Tender Notification No: ....., dtd ..... for  
Retender for the Repair and Reconditioning of 25 kWp Off Grid Solar Power plant at  
Puravayal Tribal Hamlet, Marayoor, Idukki

To

The CEO, ANERT

We, the undersigned, declare that:

1. We have examined and have no reservations to the Bidding Document, including Addenda No.: ..... (if any)
2. We offer to supply in conformity with the Bidding Document and in accordance with the delivery schedule and this is as per the visit to the sites. We also undertake that we will complete any additional works required for the successful commissioning of the power plants.
3. Our Bid shall be valid for a period of 3 months from the date fixed as deadline for the submission of tenders in accordance with the Bidding Document, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
4. If our Bid is accepted, we commit to submit a Security Deposit in the amount of 3 percent of the Contract Price for the due performance of the Contract;
5. We are not participating, as Bidders, in more than one Bid in this bidding process;
6. Our firm, its affiliates or subsidiaries, including any subcontractors or suppliers for any part of the Contract, has not been declared ineligible by the ANERT or Government of Kerala;
7. We understand that this Bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal Contract is prepared and executed.
8. We have visited all the sites for which we have quoted and all additional works required for the successful commissioning of the Solar Power Plant will be done by us. In case, we fail to do so, ANERT may initiate the required proceedings against us.

Date

Signature  
Name

## **ANNEXURE D – DECLARATION OF RELATIONSHIP WITH ANERT EMPLOYEE**

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(to be signed and submitted by the bidder along with the bid)

Tender Notification No.: .....  
Retender for the Repair and Reconditioning of 25 kWp Off Grid Solar Power plant at  
Puravayal Tribal Hamlet, Marayoor, Idukki

To  
The CEO  
ANERT

Name of the ANERT employee with Designation:

Name of the bidder related to the employee:

This is to put on record that Shri/Smt .....  
currently working as ..... in ANERT is related  
to ....., who is the bidder in the bid. We are aware of  
the Anti-corruption policy of ANERT and will observe the highest standards during the  
procurement and the execution of contract and shall retain from corrupt, fraudulent,  
collusive or coercive practices on competing for the contract.

Signature

Name

Date

## FORMAT A – COMPONENT WISE SPLIT UP OF COSTS

*(On Letterhead of the respective entity for which the below details are provided.)*

*To be provided for all capacity quoted by the bidder*

S/N	Component	Percentage (%)
1	Battery	
2	Hybrid Inverter as per specification	
4	Balance of System	
5	Cost for 5 Year Warranty and Preventive Maintenance	
6	Installation and Commissioning Charges	
7	Insurance (From Material dispatch till 10 years warranty period)	
8	Any miscellaneous expenses required for the successful commissioning of the plant	
9	Remote Monitoring and associated costs	
	Total	100%