



**BIDDING DOCUMENT**

**FOR**

**Comprehensive Maintenance of 100KWp roof-top off-Grid Solar PV plant hybrid model installed at Bijulee Bhawan along with revival of the plant upto optimum capacity utilization**

**Bid document no. AEGCL/MD/Tech-634/SOLAR PLANT/BD**

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## **SECTION -1 INSTRUCTIONS TO BIDDERS**

## 1.1.General:

### 1.1.1. Introduction

The Chief on behalf of Assam Electricity Grid Corporation Limited (AEGCL) (hereinafter referred to as "the Purchaser"), issues this Bidding Document for the supply of Goods and Related Services incidental thereto as specified in below:

### 1.1.2. Scope:

The brief scope of works is as below. Detailed scope of work is given in purchaser's requirement.

- (i) Revival of the plant including supply of required material as per BoQ for full functioning of the plant upto is optimum capacity
- (ii) Comprehensive maintenance of plant such as periodic checking of the plant operation, cleaning of modules, updating system data for optimal capacity utilisation as per maintenance schedule specified in this bidding document.

## 1.2.Eligibility Criteria:

### 1.2.1. General Criteria:

This is a limited tender for only those applicants against Eol no. AEGCL/MD/Tech-634/SOLAR PLANT/EOI who has been selected based on the qualifying criteria. Accordingly, this bidding document do not specify the eligibility criteria. Prospective bidders who have not participated in the Eol process are not required to participate in this bidding.

### 1.2.2. Specific Criteria:

#### 1.2.2.1. Contractor's License:

The bidder must have valid electrical Contractor's and Supervisor's License (LT minimum up to 11 KV.) issued by any Licensing Authority of Govt. of Assam. The Bidder is to submit its manpower strength along with Wireman license from GoA.

## 1.3.Submission of Bids:

### 1.3.1. Purchase of bid document:

Tender papers can be downloaded from official website of AEGCL. However for participation in the tender, bidder has to submit a tender fee of Rs. 3000.00 (Rupees three thousand) only in the form of A/C Payee Demand Draft/ Banker's Cheque (non-refundable) duly pledged in favour of "ASSAM ELECTRICITY GRID CORPORATION LIMITED".

### 1.3.2. Important dates

Bid submission – 12:00 Hrs. on 21.11.2017

Bid opening – 14:00 Hrs. on 21.11.2017

### 1.3.3. Contents of bids:

Bids shall comprise of the following documents duly sealed and signed by the authorised person;

- (i) Letter of price bid
- (ii) Bid security in the form of BG.

- (iii) Techno commercial offer.
- (iv) Price offer as per schedule.

Following supporting documents needs to be furnished along with bid:

- (i) Valid Electrical License.
- (ii) Copy of PAN card(s).
- (iii) GST registration
- (iv) EPF registration with return copy
- (v) ESI registration

**1.3.4. Submission of bidding document:**

The bidder shall submit the bid in sealed envelope as follows

- (i) The bid should be submitted in a sealed envelope, superscribing “Comprehensive Maintenance of 100KWp roof-top off-Grid Solar PV plant hybrid model installed at Bijulee Bhawan along with revival of the plant upto optimum capacity utilization” along with name of bidder, full address and NIT reference. The price quoted by the bidder is to be entered in the bid as per format of bid schedule. Bids are to be submitted to the Chief General Manager, 1st Floor, Bijulee Bhawan on or before the bid submission deadline.

**1.3.5. Earnest Money Deposit (EMD):**

The Tender must be accompanied with earnest money as mentioned in the Details of works to be deposited in the form of Bank Guarantee (BG) of Nationalized or scheduled Bank pledged in favour of “ASSAM ELECTRICITY GRID CORPORATION LIMITED”. The earnest money will be released to the unsuccessful bidders on finalization of the tenders. The EMD to the successful bidder will be released on submission of Performance Security BG at the time of execution of the agreement.

EMD value shall be 80,000.00(Eighty Thousand only)

Validity of the EMD Bank Guarantee shall be 120 days.

## **1.4.Evaluation of Bids**

**1.4.1. Techno commercial evaluation:**

- (i) Bids submitted with substantial deviation from the requirement of the bid document shall be rejected.
- (ii) Bids submitted without following documents shall be rejected
  - a. Duly signed letter of technical bid
  - b. Authorisation (notarised power of attorney) to the bid signatory to sign the bid.
  - c. Original EMD BG of specified amount and validity
  - d. Valid electrical/other license to execute the work
- (iii) Bids of only those bidders shall be recommended for price bid opening who are found to be responsive to the requirements of the bidding document.

#### **1.4.2. Price bid evaluation:**

Price bid evaluation shall be done in accordance with procedure laid out below:

- (i) If there is discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and total price should be corrected. If there is a discrepancy between the words and figures, the amount in word should prevail. If the bidder does not accept the correction of the errors as above, his bid will be rejected and the amount of bid security will be forfeited.
- (ii) No separate declaration offering discount on price will be allowed. Offered price in the price schedule will be final.
- (iii) All quoted rate should be exclusive of all taxes applicable. Rate must be quoted as per price bid at annexure –III. Price Bid which are not submitted as per format shall be rejected.
- (iv) For evaluation purpose GST at applicable rates shall be loaded.

### **1.5.Award of Work:**

#### **1.5.1. Award of work:**

- (i) The successful bidder shall be notified through a Letter of Acceptance (LoA). After acceptance of the LoA by the successful bidder, a contract agreement will be signed within 10(ten) days
- (ii) Work should be started within fifteen (15) days from the date of issue of the Lol, failing which order may be cancelled without further correspondence.
- (iii) The successful bidder must have to complete works within 3 (Three) month from date of issue of work order & submit quantity variation within that period.
- (iv) The materials installed shall be taken over by AEGCL, after satisfactory commissioning and charging.

### **1.6.Performance security:**

The successful bidder shall have to deposit Bank Guarantees (BG) as performance security from a nationalized or scheduled Bank of RBI (situated in Assam) before receiving the final bill.

- (i) For a period of 18(eighteen) months for an amount equivalent to 10% (ten percent) against the total value of the work. The contractor shall extend the BG in due course so as keep it valid for the whole CAMC period.
- (ii) If the contractor fails or neglects to perform any of his obligations under the contract within the guarantee period, AEGCL shall have the right to forfeit the BG/Retaining amount submitted against performance either in full or in part at its absolute discretion.
- (iii) No interest shall be payable on such deposits.

## 1.7.Completion schedule

### 1.7.1. Period of completion:

- a. All supply, installation and commissioning after revival shall be completed within 60(Sixty days)
- b. Bidder shall submit a completion schedule matching with the completion period.

## 1.8.Terms of payment

### 1.8.1. Terms of Payment:

#### 1.8.1.1. Revival of plant contract

During the currency of the contract, maximum 2(two) nos. of progressive bill against revival works shall be entertained. The progressive bill will be for the actual work done for which 80% of the billed amount will be paid retaining the balance 20% by AEGCL. Final bill will be paid along with the retained amount after satisfactory completion of the work & commissioning of the plant

#### 1.8.1.2. Comprehensive Annual Maintenance Contract

For CAMC, payments shall be made quarterly from commencement of CAMC, against submission of invoice, subject to successful maintenance of the solar plant.

### 1.8.2. Paying authority

All payment shall be made from the office of the Managing Director, APDCL. The Managing Director, APDCL is the paying authority

## 1.9.Progress Report

Contractor will submit monthly progress report has to be submitted to the concerned official with photographs if necessary. In addition to this, contractor shall submit progress report as and when asked for.

Terms and conditions, which are not specified, herein above will be governed by the AEGCL's **General Conditions of Supply and Erection** in force.



## **SECTION -2 PURCHASER'S REQUIREMENT**

## 2.1. Overview of the existing plant

The Roof Top 100KWp off-Grid Solar power Plant installed at Bijulee Bhawan, Paltanbazar, Guwahati. In this Plant a total of 400 nos. of Mono-crystalline solar modules are used and each module has a capacity of 250 Wp of power. These modules are segregated in series and parallel to achieve required power. There are 10 nos. of modules connected in series and total 40 nos. of modules are connected in Parallel. These series & parallel combination of modules are combined in a small junction box, which is called Array Junction Box. At present the plant is generating approx 30 KW power.

## 2.2. Technical details of the existing plant:

Modules, 250W, 24V Mono-crystalline

Manufacturer: ALPEX SOLAR

Mono-crystalline- Si, ALP 250W

Cell area= 238.86 sq.cm,

Sensor temperature ( $^{\circ}\text{C}$ ) = 25.4, Corrected temp. ( $^{\circ}\text{C}$ ) = 25.0

Module Area= 16052.40 Sq.cm

$V_{o.c}$ (V)	$I_{sc}$ (A)	FF	$V_{mp}$ (V)	$I_{mp}$ (A)	Cell efficiency (%)	Maximum efficiency (%)	$P_{max}$ (W)
37.66	8.78	0.729	29.41	8.19	16.8	15.0	241

PV Mounting structures – PV modules are mounted on structures with foundation on rooftop.

The connections made are as follows:-

- 10 PV modules are connected in series to make 1 string and output to be available at Array Junction Box (AJB)
- 40 such strings are connected in parallel using Inter-Array Junction Boxes (IAJBs) and Main Junction Boxes (MJBs)
- Output of Solar array connected with PCU through a Switch Fuse Unit (Solar PV SFU)
- Battery Bank of 240V/1000Ah capacity connected with PCU (Power Conditioning Unit)/ Inverter through a Switch Fuse Unit (Battery bank SFU)
- Mains 3-ph input is also connected with PCU/ Inverter.
- 3 phase Output of PCU/ Inverter connected with load through a changeover switch

## 2.3. Scope of works

### 1.3.1. Revival of rooftop off grid solar PV plant:

- (i) Inspection the roof top solar PV plant installed on the roof of Bijulee Bhawan and identifying the faulty panels, damaged structures, cables and cable connections, Array junction Box, and protection systems thoroughly.
- (ii) Supply and installation of PV modules (of matching capacity and specification with existing modules) replacing the damaged modules.

- (iii) Repairing of broken/damaged module structures including construction of foundation if necessary and including supply of all materials necessary for the job.
- (iv) Shifting of identified modules from shadow area to suitable non-shadow area including construction of new foundation and structure and including supply of all materials for structure and foundation.
- (v) Installation of lightening, short circuit and earthing protection system for the solar plant.
- (vi) Laying and Connection of all cables, junction boxes and PV modules for successful operation of the solar plant including supply of required cables, lugs. Connectors, AJB , fuses etc and commissioning of the plant.
- (vii) Supply and installation of 1.5 Ton 5 star, copper condenser, split type inverter AC including supply of cable, MCCB etc. in the solar battery room at ground floor.
- (viii) Bidder has to guarantee the min/max values for parameters mentioned below:

Sl. No.	Parameter	value	Remarks
1	Power output after revival of plant at solar irradiance (Direct Normal Irradiance) of 3.5 KWH/m <sup>2</sup>	Average 260 KWH(min) per day	Power output shall be assessed based on monthly power generated.
2	Efficiency	>75%	After Considering inverter loss, temperature loss, DC and AC cable losses, shading, weak radiation, dust etc

- (ix) On completion of the revival activity and commissioning of the plant, contractor shall demonstrate the plant's capacity and efficiency through calculation and measurement of solar irradiance.

### 1.3.2. Comprehensive Annual maintenance of rooftop off grid solar PV plant:

On successful completion of the revival activities and commissioning of the plant, the contractor shall be responsible for comprehensive maintenance of the solar plant. CAMC shall start from the date of successful commissioning of the plant after revival for a period of three (03) years.

The contractor shall be responsible for maintaining the plant to keep it running to generate minimum guaranteed generation capacity. Supply of spares and services shall be in the scope of the contractor except for cases where specifically mentioned otherwise. Contractor shall also ensure engagement of professionally qualified service personnel for the maintenance activities of the plant.

Sl. No.	Description of activities	Frequency	Remarks
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1	Thorough check up of plant after commissioning to identify faults and defects if missed during revival and rectifying of the same	One time after 30 days from commissioning of the plant	
2	Cleaning of solar PV panels	Once in 3 months	
3	Maintenance of PV modules, cables connections, junction boxes, safety equipments and other associated electrical items.	Once in 2 months for first year. Every month after one year.	
4	Visual inspection to check any damage to the system and rectification of the defects	Immediate after storm, cyclone	Replacement of damaged module and structure is not in contractor's scope. But contractor shall report and suggest any such requirement for normal operation of the plant.
	Checking of battery health & PCU functioning and reporting in case of any malfunction	Once in 1 months	Checking and reporting of any malfunction observed or defect identified.
5	Unplanned defect rectification of the system	On call	Contractor's service personnel has to attend the problem within 3 Hours – Severe problem (viz complete shutdown, safety hazard etc.) 8 Hours – Moderate problem

#### 2.4. Penalty for power generation below minimum generation value

If the contractor, after successful commissioning of the plant, fails to maintain the plant at the guaranteed minimum generation value, penalty shall be levied at a rate calculated per below formula:

Energy generation in KWH/year (calculated),  $E_c = \text{DNI} \times (\text{No. of functional modules}) \times 0.25 \times 0.75 \times 365$

Energy generation,  $E_a$  in KWH for the year = Actual as taken from PCU

Generation shortfall,  $G_s = E_c - E_a$

Penalty for the assessed year, P in Rs. =  $G_s \times \text{average cost of electricity per Kwh of APDCL.}$

Note:

- (i) DNI (Direct Normal Irradiance) shall be considered as 3.5 KWH/m<sup>2</sup> for calculation of penalty. In the event of any disagreement on the same, DNI data for the applicable year from MNRE shall be applicable subject to availability of data for the year.

- (ii) Contractor has to specify non functional module in their maintenance report for the same to be considered in penalty calculation.
- (iii) Penalty if applicable shall be calculated at the end of the year (starting from AMC start date) and shall be levied and deducted from fourth quarter bill. In case, the penalty amount could not be recovered in full from fourth quarter bill same shall be recovered from next quarter's bill or any other bill at the discretion of the paying authority.
- (iv) In case the plant is in shut down, complete or partial, for certain period, due to reasons not attributable to the contractor, amount of energy generation (calculated) for that period shall be deducted, for penalty calculation.

## **2.5.Specifications of equipment/material to be supplied:**

PV modules: The solar PV modules shall be of matching technical specification of reputed make approved by MNRE with a minimum warranty of 20 years.

Support structure: Mounting structure supplied shall be of non-corrosive materials and designed to bear the load of module and maximum wind pressure for wind speed of 150 kmph. Inclinations shall be provided matching with latitude and for maximum solar irradiance. No provision for adjusting inclination angle is required.

LA : 11 KV class 2 MO LA and should meet IEC 61643-11:2011/ IS 15086-5 (SPD)

Cables and cable laying: Cables should meet BS EN 50618. Cable laying should be done using PVC pipe.

## **SECTION -3 PRICE SCHEDULE**

## Price schedule -1

Supply, installation and commissioning services for revival of rooftop solar plant

All prices are in ₹

Sl. No.	Item description	Unit	Qty	Unit price (without taxes)	Total amount (without taxes)	Remarks (give HSN code and GST rate)
1	2	3	4	5	6=4x5	7
1	Supply and installation of 250 W, 24 W monocrystalline solar PV module	No.	03			
2	Re-construction of broken/damaged solar module structures including supply of required structure materials	No	02			
3	Shifting of identified PV modules from shadow area to shadow free area including construction of structure and foundation(including supply of all materials)	No.	28			
4	Supplying of all necessary cables, cable lugs, connectors, fuses and junction boxes for reconnection of the PV modules.	LS	01			
5	Supply of 11 KV LA and installing at designated position for protection of solar PV plant	Set	05			
6	Construction of earth pit including supply of all materials	No.	04			
7	Laying and Connection of all cables, junction boxes and PV modules for successful commissioning of the solar plant	LS	01			
8	Earthing of all structures and plant equipments including supply of earthing strip	LS	01			
9	Supply and installation of 1.5 Ton 5 star, copper condenser, split type inverter AC including supply of cable, MCCB etc. in the solar battery room at ground floor.	No.	02			

**Note: Unit prices should be inclusive of all supply, F&I and cost of installation and commissioning services/labour.**

## Price schedule -2

### Comprehensive annual maintenance rooftop solar plant

All prices are in ₹

Sl. No.	Item description	Unit	Qty	Unit price (without taxes)	Total amount (without taxes)	Remarks (give HSN code and GST rate)
1	2	3	4	5	6=4x5	7
1	Comprehensive annual maintenance of the plant after revival of the plant as per bid specification.	Year	03			

**Note: Unit prices should be inclusive of all supply, F&I and cost of AMC services/labour.**



## **SECTION -4 APPENDIX**

## Letter of Technical bid

[Bidder's Letterhead]

Date: .....

Bid Identification No (s): .....

Invitation for Bid No.: .....

To

The Chief General Manager  
Assam Electricity Grid Corporation Limited  
Bijulee Bhwan, Guwahati-781001

Sir,

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Documents, including Addenda issued to the bidding document;
- (b) We offer, in conformity with the Bidding Document the following . . . . .

Comprehensive Maintenance of 100KWp roof-top off-Grid Solar PV plant hybrid model installed at Bijulee Bhawan along with revival of the plant upto optimum capacity utilization

- (c) Our Bid consisting of the Technical Bid and the Price Bid shall be valid for a period of 120 days from the date fixed for the bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period

Name .....

In the capacity of .....

Signed .....

.....

Duly authorized to sign the Bid for and on behalf of .....

Date .....

## Format for Notification of Award

[Letter head]

To: [ Name and address of the Supplier ]

Sub: Letter of Acceptance - Comprehensive Maintenance of 100KWp roof-top off-Grid Solar PV plant hybrid model installed at Bijulee Bhawan along with revival of the plant upto optimum capacity utilization

Ref:

Dear Sir,

This is to notify you that your Bid dated [date] for execution of the [ name of the Contract and identification number, as given in the Contract Data ] for the Contract Price in the aggregate of [ amounts in numbers and words ] [ name of currency ] (as per Price Schedule-1 & 2), as corrected and modified in accordance with the Instructions to Bidders is hereby accepted, and it is decided to award on you the 'solar PV plant revival' contract and CAMC for 3 years covering inter-alia supply and delivery of all Goods including F&I.

You are requested to furnish the Performance Security within seven (7) days in accordance with the Conditions of Contract, using for that purpose the Performance Security Forms included in appendix of the Bidding Document

[Authorized Signature]

[Name and Title of Signatory]

Attachment: Draft Contract Agreement

## Format of Performance Security

### Bank Guarantee

(To be stamped in accordance with Stamp Act)

To: \_\_\_\_\_ [name of Purchaser]  
\_\_\_\_\_ [address of Purchaser]

WHEREAS \_\_\_\_\_ [name and address of Supplier/Manufacturer] has undertaken, in pursuance of Contract No. \_\_\_\_\_ dated \_\_\_\_\_ to execute \_\_\_\_\_ [name of Supplier/Manufacturer and brief description of Scope] (hereinafter called "the Contract");

AND WHEREAS it has been stipulated by you in the said Contract that the Supplier/Manufacturer shall furnish you with a Bank Guarantee by a recognized/scheduled bank for the sum specified therein as security for compliance with its obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Supplier/Manufacturer such a Bank Guarantee;

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Supplier/Manufacturer, up to a total of \_\_\_\_\_ [amount of Guarantee] \_\_\_\_\_ [in words], such sum being payable in the currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of \_\_\_\_\_ [amount of Guarantee] as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Supplier/Manufacturer before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the scope to be performed thereunder or of any of the Contract documents which may be made between you and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall be valid until the date, 30 days beyond the Warranty Period as per the Contract.

Signature and Seal of the Guarantor \_\_\_\_\_  
Name of Bank \_\_\_\_\_  
Address \_\_\_\_\_  
Date \_\_\_\_\_

\_\_\_\_\_