Notice Inviting Tender

Subject: Supply, Installation, and Commissioning of a Multi-level, Self-Cleaning Solar Tree of installed capacity of minimum 5 kW at Jorhat

Sealed tenders for Technical and Commercial bids are hereby invited from competent vendors/suppliers/agencies with details are given below-

SL. NO	DESCRIPTION	PLACE OF DELIVERY	Place of Installation
1	Supply, Installation and Commissioning of a Self-cleaning Multi-Level Vertical Solar System (Surya Taru) of minimum installed capacity of 5 KW	The Assam Kaziranga University, Koraikhowa , Jorhat – 785006	**Jorhat** Planetarium Campus

1. **Type of Bidding:** 2-Bid System: Technical and Commercial. Technical and Commercial Bids are to be submitted separately in sealed envelopes, prosscribed "Technical Bid for Surya Taru" or "Commercial Bid for Surya Taru". Only technically qualified bids shall be considered for commercial evaluation.

2. The copy of the bid may be submitted by hand or by post to "Registrar, The Assam Kaziranga University, Koraikhowa, Jorhat – 785006" within 30th of July, 2025, 03:00 pm.

3. Bids incomplete in any way, or received after due date and time, shall be summarily rejected.

4. Vice Chancellor, The Assam Kaziranga University retains the right to reject any or all the bids without assigning and reason

5. Any information pertaining to the tender process and the submission of supporting documents shall not be entertained after the due date.

Annexures:

1. Details for Technical Bid
2. Details for Commercial Bid
3. Details of Technical Evaluation
4. Details of Technical Certification

Registrar

Annexure 1: Details for Technical Bid

Technical Specification for 5.5kW Solar Tree

1. SOLAR TREE STRUCTURE:

a. Structural material shall be corrosion resistant and electrolytically compatible with the materials used in the module frame, its fasteners, and nuts and bolts. Galvanizing should meet ASTM A-123 hot dipped galvanizing or equivalent which provides at least spraying thickness of 70 microns on steel as per IS5905, if steel frame is used. Aluminium frame structures with adequate strength and in accordance with relevant BIS/ international standards can also be used. All the panels should be placed tilted oriented towards South to reduce shading loss.

b. Total structure height should be approximately 8 meters.

c. Central structure (trunk) should be divided into 3 sections for easy installation. The tree should support the containers for batteries in the trunk/ branches with appropriate connections.

d. Provision to install solar panel on three levels without shading and solar panel mounting arrangement should look like branches of the tree.

e. Minimum 2.5mtrs clearance from ground level needed for first branch.

f. Length of branch should be in descending order from bottom to top.

g. Number of branched should be in descending order from bottom to top.

h. The branches should be able to move horizontally.

i. Solar panel mounting arrangement should be done such that they can be tilted to south at defined angle which nearly equal to latitude of site.

j. Wherever required, suitable number of PV panel structures shall be provided. Structures shall be of flat-plate design either I or L sections.

k. Arrangement to install pot on the trunk as well as on the branches.

l. Weather proof and rust proof Enclosures to install batteries should be provided on trunk.

2. SOLAR PANELS:

a. The total solar PV array capacity should not be less than 5.5KWp and should comprise of polycrystalline/monocrystalline of minimum 400 Wp and above wattage. Module capacity less than minimum 400 watts should not be supplied. The module type must be

qualified as per IEC 61215/IS 14286 latest editions for Crystalline Silicon PV Module. SPV module conversion efficiency should be equal to or greater than 13 – 14 % under STC. Modules must qualify to IEC 61730 Part I and II for safety qualification testing.

b. The number of Solar Panels should be 14 or more, as per the structural design

Certificate for module qualification from IEC or equivalent to be submitted as part of the bid offer. Undertaking from manufacturer / supplier that the modules being supplied are as per above.

c. The PV module shall perform satisfactorily in humidity up to 100% with temperature between – 20 0C to + 85 0C. Since the modules would be used in a high voltage circuit, the high voltage insulation test shall be carried out on each module for acceptance

d. The predicted electrical degradation at the end of the period of 15 years shall be less than ten (10) per cent of the full rated original output.

e. Raw materials and technology employed in the module production processes shall have to be certified and a certificate giving details of major materials i.e. cells, glass, back sheet, their makes and data sheets to be submitted for the modules being supplied by the bidder.

f. The rated output power of any supplied module shall have tolerance of +/- 3% as per standard specified by MNRE (Ministry of New and Renewable Energy).

g. The module frame, if any, shall be made of a corrosion-resistant material which shall be electrolytically compatible with the structural material used for mounting the modules.

h. The module shall be provided with a junction box with either provision of external screw terminal connection or sealed type and with arrangement for provision of by-pass diode. The box shall have hinged, weather proof lid with captive screws and cable gland entry points or may be of sealed type and IP65 rated.

i. The solar panel should be listed in the Ministry of New and Renewable Energy (MNRE) issued “Approved Models and Manufacturers of Solar Photovoltaic Modules (Requirement for Compulsory Registration) Order, 2019” on 02.01.2019.

3. POWER CONDITIONING UNIT (PCU)

The PCUs required shall be of 5 KVA Hybrid with provision for battery back-up, should convert DC power produced by SPV modules in to AC power and adjust the voltage & frequency levels to suit the local grid conditions. The 5 KVA Hybrid PCU with battery back-up shall feed power to the lighting / dedicated loads.

Control Type:	Voltage source, microprocessor assisted, output regulation
Output voltage:	1 phase, 230 V ac (+12.5 %, - 20 % V ac)

Frequency:	50 Hz (+3 Hz, -3 Hz)
Continuous rating:	5 KVA Hybrid inverter
Nominal Power:	5 KVA
Surge Power:	10000VA
Wave form:	Pure Sine Wave
Total Harmonic Distortion:	less than 3%
Operating temperature Range:	0 to 55 deg C
Housing cabinet:	PCU to be housed in suitable switch cabinet,
IP:	20 degree of ingress protection
PCU efficiency:	94 % and above at full load,
Power Control:	MPPT
Battery Type Supported:	**Lithium-ion, Lead-acid, smf**
Display:	LED+LCD
Communication Interface:	CAN/RS485 for Li-ion battery BMS communication.
Max. PV Input Power (W):	8000W
Remote communication:	Wifi/GPRS
Operating Temperature Range:	0℃~50℃
Relative Humidity:	5~95% Relative Humidity (Non-Condensing)
Weight (kg):	less than 20kg
Installation Style:	Wall bracket

4. **Grid Connection:** Provision to be incorporated.

5. **Electrical safety, earthing and protection**

   a. Over Voltage Protection: Over Voltage Protection against atmospheric lightning discharge to the PV array is required. Protection is to be provided against voltage fluctuations and internal faults in the power conditioner, operational errors and switching transients.
   b. 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.
   c. Cabling practice: Cable connections must be made using PVC Cu cables, as per BIS standards. All cable connections must be made using suitable terminations for effective contact. The PVC Cu cables must be run in conduits for protection.

d. The PCU shall include an easily accessible emergency OFF button located at an appropriate position on the unit.
e. The PCU shall include ground lugs for equipment and PV array grounding.
f. Weather proof electrical cabinet approx. (600 X 1800 X 500 mm) for DC/AC termination and PCU installation.
g. The PCU enclosure shall be weatherproof and capable of surviving climatic changes and should keep the PCU and AC/DC termination intact under all conditions in outdoor condition below the solar tree where it will be installed on a concrete platform approx. 1 ft above the ground.
h. Components and circuit boards mounted inside the enclosures shall be clearly identified with appropriate permanent designations, which shall also serve to identify the items.
i. All doors, covers, panels and cable exits shall be gasketed or otherwise designed to limit the entry of dust and moisture. All doors shall be equipped with locks.
j. All switches at the, circuit breakers, connectors should confirm to IEC 60947, part I, II and III.

6. BATTERY BANK:

a. The battery bank is to be designed to provide the backup power for feeding the dedicated loads in the event of failure of grid supply.
b. Storage Capacity: 48V, 150 Ah (Approx)
c. Type: Tubular Gel batteries/ lithium Ion Battery/SMF Batteries from reputed manufacturers.
d. The battery cells shall have high ampere hour efficiency so as to quickly pick up the charge of the order 95%. High watt hour efficiency of at least 85%
e. The batteries shall be solar photo voltaic batteries of Tubular Gel type/lithium Ion/SMF type or low maintenance, lead Acid and made of hard rubber container.
f. Storage batteries should conform IEC 61427 / IS 1651 / IS 133369 as per specifications.
g. The self-discharge of batteries shall be less than 3 % per month at 20 deg. C and less than 6% per month at 30 deg. C
h. The charge efficiency shall be more than 90% up to 70% state of charge.

7. Self-Cleaning Automatic Washing

(a) Automatic solar panel washing system should be provided to wash each panel daily.
(b) User selectable/configurable timing system for automatic washing system.

8. Pots with Self irrigation of Pots

a. Provision for 100 or more Pots to be placed on different parts of the Trunk and the Branches
b. Drip irrigation system implemented for pots installed on solar tree.

9. Painting

The complete Solar Tree and the Branches are to be painted in aesthetic, corrosion resistant paints

10. Base

An elevated (1 ft) paving of 5 mx5 m in suitable material (like inter-locked blocks) is to be provided at the base

11. Others:

(a) Erection of a 2 mx2m Board on Stainless Steel Poles with pedagogic material on Solar Tree with lighting supplied by the Solar Tree

(b) Self-lighting of the Solar Tree with multi-coloured LED lights

(c) Training for operation and maintenance.
(d) Warranty and post-installation support.

Miscellaneous:

- **a.** Supply of the complete systems, including all necessary components, subcomponents, spares, consumables, tools & tackles etc. as per technical specifications given elsewhere in this document.
- **b.** Erection and commissioning of the supplied systems at the specified site.
- **c.** The grid supply connection would be provided with auto change over for topping up of the battery in case of low solar flux period.
- **d.** All cabling and load connections should be carried by the supplier with proper synergy with the existing electrical systems of the project site.
- **e.** The supplier shall provide the necessary training to identified representatives for proper daily operation and maintenance of installed systems.
- **f.** Pavement of 4-meter X 4 meter should be built around solar tree.
- **g.** Vendor should lay the armour cable of approx. 30 meters from inverter to mains. The cable should be chosen as per the current rating.

Technical Qualification

Successful Technical Evaluation will require

1. Certificate of Incorporation/Registration of the Bidder's Company
2. Certificates from (Ministry of New and Renewable Energy (MNRE) and Other relevant agencies
3. Certificate for module qualification from IEC or equivalent or undertaking from manufacturer / supplier that the modules being supplied are as per above.
4. A Structural Design drawing of the proposed Solar Tree as per specifications, suitable for Seismic Zone 5 and with battery storage facilities on trunk/ brunches.
5. A Schematic of the Solar Tree circuitry, showing self-cleaning system
6. Experience certificate, support by purchase order/ competition certificate of similar installation in past 3 years (exempted for companies with MSME/ startup certificate)
7. A valid website in the name of the company
8. Successful Technical Presentation on the Implementation Plan

Failure in any one of the above items shall lead to technical disqualification. Only technically qualified bids will be considered for commercial evaluation

Technical Certification

Technical Certification will require all the items mentioned under Technical Specifications to be supplied, installed and integrated at site and successful commissioning, with successful demonstration, including

1. Since the modules would be used in a high voltage circuit, the high voltage insulation test shall be carried out on each module for acceptance

2. A certificate giving details of major materials i.e. cells, glass, back sheet, their makes and data sheets to be submitted for the modules being supplied by the bidder

3. Proof that solar panel are listed in the Ministry of New and Renewable Energy (MNRE) issued "Approved Models and Manufacturers of Solar Photovoltaic Modules (Requirement for Compulsory Registration) Order, 2019" on 02.01.2019.

4. Conformity of switches at the, circuit breakers, connectors should confirm to IEC 60947, part I, II and III.

5. Demonstration of full functionality of solar tree, including self-cleaning and self-irrigation and lighting at the installation site.

Commercia Bid

1. **Scope of Bid**
   The commercial bid must cover the complete supply, installation, and commissioning of the Self-Cleaning Solar Tree System as per the prescribed specifications. Partial or incomplete bids will not be considered.

2. **Delivery Timeline**
   The bidder shall clearly specify the period of delivery, which must not exceed 12 weeks from the date of the purchase order.

3. **Currency and Manner of Quotation**
   Prices must be quoted in Indian Rupees (INR), inclusive of delivery at The Assam Kaziranga University, Jorhat. Bids not quoting the price in INR or not including delivery will be rejected. All prices must be stated both in figures and words.

4. **Price Firmness and Adjustments**
   The rates quoted by the bidder shall remain firm and fixed for the entire duration of the contract, with no escalation permitted for any reason. However, any benefit arising from a reduction in duties or taxes after the rates have been finalized and before delivery shall be passed on to the Purchaser (i.e., The Assam Kaziranga University).

5. **Discrepancy Clause**
   In the event of any discrepancy between the amounts stated in figures and in words, the amount stated in words shall prevail.

6. **Price Inclusivity**
   The quoted unit price shall be inclusive of standard packing, freight to destination, transit insurance, loading and unloading charges, installation, and all other incidental costs necessary for successful delivery and commissioning at site.

7. **Taxation**
   Goods and Services Tax (GST) must be indicated separately, both as a percentage and in absolute INR value.

8. **Tax Deduction at Source (TDS)**
   Applicable TDS as per prevailing Government of India rules will be deducted at the time of making payment.

9. **Warranty**
   The bid must include details of the comprehensive onsite warranty (minimum one year) against manufacturing defects and installation defects.

10. **Penalty for Delay**
    A penalty clause shall apply for delayed completion of supply, installation, or commissioning, for example, at the rate of 0.5% of the contract value per week of delay, subject to a maximum of 10% of the total contract value.

IMPORTANT POINTS

1. **The bidders are welcome to visit and survey the site with prior appointment at their own expenses**
2. **Payment Terms**: Payment shall be made in Indian rupees.100% Payment shall be released after the successful delivery, installation and Technical Certification. PAN card, Bank Account details, Bank Address are to be submitted while submission of the quotation, forwarded along with the invoice.
3. **Placing Purchase Order**: KU will place order on identified successful bidder. All the payments shall be made directly by KU to the successful bidder as per the tender terms and conditions.
4. Incomplete Bid, or Failure to furnish any of the required documents shall result in summary rejection of the bid. If any of the documents furnished by the bidder is found to be false/fabricated/bogus, the Bidder will be disqualified and blacklisted.
5. Only the financial bids of the technically qualified bidders shall only be considered.
6. Installation must follow safety and regulatory compliance standards
7. The decisions of the KU competent Authority shall be binding and final

Documents to be enclosed with Commercial Bid:

1. Complete address of firm with telephone number and email id, with address proof
2. Name and address of the Designated Authority
3. Copy of valid trade license.
4. Copy of GST registration Certificate.
5. Copy of Company Pan Card.

Bidder letter form

From:
(Registered name and address of the bidder)

To
The Registrar,
The Assam Kaziranga University,
Koraikhowa, Jorhat.

Sir/Ma'am,

Having examined the bidding documents and the tender call dated.....

1. I/We hereby offer to Supply and Installation of self-maintaining Solar panels for installation of a Self-Maintaining Vertical Solar System (Surya Taru) for agricultural and Industrial Applications.

2. I/we shall be bound by a communication of acceptance / rejection by KU.

3. I/We have understood the Instruction to bidders and terms and conditions of Contract enclosed with the invitation to the tender and have thoroughly Examined the specifications quoted in the Schedule hereto and am/are fully aware of the nature of the goods required and my/our offer is to supply the goods strictly in accordance with the specifications and requirements.

4. Certified that ours is:

(a) A sole proprietorship firm and the person signing the bid document is the sole Proprietor/constituted attorney of the sole proprietor (OR)
(b) A partnership firm, and the person signing this bid document is a partner of the firm and has authority to refer to arbitration disputes concerning the business of the partnership by virtue of the partnership agreement /by virtue of general power of attorney (OR)
(c) A company and the person signing the document is the constituted attorney/authorized signatory.
(NOTE: Strike out whatever is not applicable. All corrections/deletions should invariably be attested by the person authorized to sign the bid document).

5. If bid is accepted, I/we undertake to;
(a) Provide services/execute the work according to the time schedule specified in the bid document,

I/We understand that you are not bound to accept the lowest or any bid you may receive, nor to give any reason for the rejection of any bid.

Yours faithfully,

(Signature)