

**Ashoka Trust for Research in Ecology and the Environment (ATREE)**  
Implementing Agency for

**BR Hills Wild Honey Bee Cluster (Major)**  
*B.R. Hills, Yellandur Taluk, Chamarajanagara District, Karnataka*

Ref No: BRH-WHBC/Tender/04

Date: 31 May 2023

Ashoka Trust for Research on Ecology and Environment (ATREE) at Royal Enclave, Srirampura, Jakkur Post, Bengaluru, Karnataka 560064, invites tender for **supply, installation, testing and commissioning of 15 KWp through Solar PV System to BR Hills Wild Honeybee Cluster's CFC at BR Hills, Yellandur Taluk, Chamarajanagara District, Karnataka**

**Bidding Information:**

1	Tender Reference No.	BRH-WHBC/Tender/04
2	Date of sale of Tender document	31-05-2023
3	Date and time of pre-bidding meeting	6-06-2023, 3pm
4	Last date and time of submission of bids	17-06-2023
5	Date and time of opening the technical bid	22-06-2023, 3pm
6	<b>15 KWp Roof-top Solar PV Power plant at BR Hills Wild Honeybee Cluster's CFC, BR Hills, Yellandur, Chamarajanagar, Karnataka with a one-year comprehensive contract</b>	Rs. 11 lakhs
7	Earnest Money Deposit in favour of ATREE, Bengaluru	Rs.22,000/-
8	Tender Document fees	Rs. 1,000/- Non-refundable and non-transferable.
9	Address for communication	Dr. Siddappa Setty R ATREE, Royal Enclave, Srirampura, Jakkur Post, Bengaluru 560064

A complete set of the Bid documents containing the details of the terms and conditions may be downloaded from the website: [www.milletmagicfoundation.in](http://www.milletmagicfoundation.in) and the same can be submitted along with cost of tender paper in shape of Bank Draft. Any corrigendum/addendum/ information related to this NIT will only be uploaded in [www.atree.com](http://www.atree.com)- website which will not be published in Newspapers. The authority reserves the right to accept / reject any part or all the bids without assigning any reason thereof. The authority has the right to increase/ decrease / cancel the quantity without assigning any reason thereof.

**TENDER DOCUMENTS**

For

**Supply, Installation, Testing and Commissioning of 15 KWp through Solar PV System  
at BR Hills Wild Honeybee Cluster's CFC,  
BR Hills, Yellandur Taluk, Chamraranagara District, Karnataka**

**BR HILLS WILD BEE HONEY CLUSTER (MAJOR)**

**Implementing Agency**

Ashoka Trust for Research in Ecology and the Environment (ATREE)  
Bengaluru

**Nodal Agency**

Indian Micro Enterprises Development Foundation (IMEDF)  
New Delhi

**Technical Agency**

Keystone Foundation  
Kotagiri

May 2023

## TENDER NOTICE

Supplying, Installing, Testing and Commissioning of 15 KWp through Solar PV System at BR Hills Wild Honey Bee Cluster's CFC, BR Hills, Yellanduru, Chamarajanagara, Karnataka

Sealed tenders are invited from registered firm /individuals for **supply, installation, testing and commissioning of 15 KWp through Solar PV System** at BR Hills Wild Honey Bee Cluster's CFC, BR Hills, Yellandur Taluk, Chamarajanagara District, Karnataka, being facilitated by Ashoka Trust for Research on Ecology and the Environment (ATREE) as the Implementing Agency for BR Hills Wild Honey Bee Cluster (Major). Tender should be submitted in double bid system (technical and financial bid separately) along with earnest money deposit (EMD) of Rs. 22,000/- (Rupees Twenty-two thousand Only) and can be deposited at the ATREE's Bengaluru office up to 05.00 PM on 6<sup>th</sup> June 2023. Tenders received will be opened in the presence of the Working Committee on 22nd June 2023 at 3pm.

This is a percentage-based tender. Tender form can be obtained from the office of ATREE, Bengaluru on any working day and working hours from the date 1st June to 6th June 2023 by payment of Rs. 1,000/-. Tender forms can also be downloaded from the website [www.atree.org/tenders](http://www.atree.org/tenders) A demand draft (DD) of Rs. 22,000/- purchased in favour of "Ashoka Trust for Research in Ecology and the Environment" payable at Bengaluru should be enclosed along with the Technical Bid for the Tender Forms downloaded from the website.

The details of works and Terms and Conditions are available in the Tender Form. ATREE reserves the right to cancel any or all the Tenders without assigning any reason.

## **PART 1: SCOPE OF WORK**

### **1.0 WORK DESCRIPTION**

- 1.1. This specification covers the 'General Requirements' for the design, manufacture, supply Performance, inspection, testing and commissioning of required rating of minimum 15KWp.
- 1.2. The solar panels shall be installed on GI structure/RCC Roof over the terrace area and as per conceptual plans.

### **2.0 SYSTEM DESCRIPTION (GRID CONNECTED SYSTEM)**

- 2.1 The Photovoltaic (PV) Grid connects system consists is having mainly of 3 components: The Crystalline Silicon PV array, Module Mounting Structure and the Power conditioning Unit (PCU). The C-Si module will generate the DC voltage and to increase the voltage to make it suitable for the PCU rating.
- 2.2 The PCU is nothing but converting the Direct Current (DC) Power into Alternating Current (AC) power and feeding into the grid. It is design with a high efficiency greater than 98% with IGBT technology, it is delivering the maximum Power generated through solar modules in to grid due to its inbuilt feature of MPPT operations. The PCU is having internal self-protection in case of any fault in the grid. Also, the PCU has inbuilt contactors /breakers with fuses for self-protections.
- 2.3 The PCU is having inbuilt microprocessor-based controls before starting it monitors the grid voltage, frequency of the grid if it is within set value then it senses the array voltage and current errs are within range. In case of power gets fail the PCU will stop working automatically. During the morning the PCU starts on its own when the power generation start from the solar module and stops automatically when the sun set and array is not generating any power.
- 2.4 Each PCU is having a remote and local data monitoring system with which one can monitor all the parameters and current energy generation & past generation for the given period. Outputs of ply will be brought to distribution boards for synchronization with the PCU.
- 2.5 The power generated from the PV Modules will be supplied to the load through solar inverter unit (part of PCU), which converts DC power to pure 440V/230V AC sine wave power. The inverter unit will power the dedicated loads either from the solar array or battery bank in that order of preference. The inverter is designed for catering the power needs of the load.

### **3.0 SUBMISSION**

- 3.1 All technical submissions shall be approved by the EPC contractor prior to the respective stages of construction with respect to the approved design and development documents. In case of major deviations, it shall be brought under the notice of Engineer in Charge for its review and approval.
- 3.2 Such drawings shall show the proposed method of construction of the Solar PV systems
- 3.3 The drawings shall also incorporate a full list of proposed materials.
- 3.4 Pre delivery inspection of materials at manufacturer's works, pre commissioning test at site and preparation of report in formats are included.
- 3.5 Submission of test certificate and testing procedure details prior to pre delivery inspection.
- 3.6 Providing procedures detail for pre commissioning of equipment installed and testing.
- 3.7 Preparation of as built drawings for the services rendered by the contractor.
- 3.8 Any other work / activity which is not listed and is necessary for completeness of electrical system

### **4.0 ELECTRICAL FEATURES OF CRYSTALLINE SILICON SOLAR PHOTOVOLTAIC MODULE**

- 4.1 Modules array consists of high efficiency Solar Modules utilizing crystalline high-power Silicon Solar Photo Voltaic cells.
- 4.2 Solar module has laminated using lamination technology using established polymer Ethylene-Vinyl Acetate (EVA) and Tedlar/ Polyester laminate.
- 4.3 535Wp solar module consists of required crystalline silicon photovoltaic cells.
- 4.4 Solar Modules has made with High Quality, High Transmission 3.2 mm tempered Solar Glass.
- 4.5 The efficiency of Solar Photovoltaic module is greater than 18%. It has made of high transmissivity glass front surface giving high encapsulation gain and hot butyl rubber edge sealant for module protection and mechanical support.
- 4.6 All materials used in manufacturing of module have a proven history of reliable and stable operation in external outdoor applications
- 4.7 Solar module has designed to operate and perform in relative humidity up to 100% with temperatures between -10 Deg C and +85 Deg C and withstand gust up to 200km/h from back side of the panel.

- 4.8 Sturdy New screw type anodized Aluminium frame design using double sided tape for framing.
- 4.9 Solar Modules have IEC and UL approved, IP 65 rated junction box assembly using USE cable and UL approved connectors. Three Schottky bypass diodes used for preventing any damage due to shading
- 4.10 Degradation of power generated will not exceeding 20% of the min. Rated power over the 25-year period. Efficiency of solar PV system is to 90% for above 12 years & 80% for above 25 years.
- 4.11 The solar modules have suitable encapsulation and sealing arrangements to protect the silicon cells from the environment. The arrangement and the material of encapsulation are compatible with the thermal expansion properties of the Silicon cells and the module framing arrangement/material.
- 4.12 Multi-layered Back sheet giving weather-able barrier for modules and high performance in rugged environments around the world, high dielectric performance, superior partial discharge and electrical insulation properties.

## **5.0 SYSTEM CONFIGURATION**

### **5.1. PV MODULES**

- a) A Photovoltaic module is a packaged interconnected assembly of Photovoltaic cells, which converts sunlight into Electrical Power. The Solar Modules are mono/multi crystalline type, made of High Transmissivity front glass giving high encapsulation gain and silicon rubber edge sealant for module protection, mechanical support and moisture proofing.

### **5.2. MOUNTING STRUCTURE**

- b) The Solar Module Mounting Structure (MMS) is designed for holding suitable number of modules. Modules will be mounted on Mild Steel, support structures suitable for site conditions, which are tilted according to the Site Locations to maximize annual energy output. Support Structure design and foundation or fixation mounting arrangements shall withstand minimum horizontal wind speed relevant to site conditions.

### **5.3. TECHNICAL SPECIFICATION OF PV MODULE MOUNTING STRUCTURE**

<b>Parameters</b>	<b>Specifications</b>
Type	Roof Mounted
Configuration	Designed to suit site requirements
Material	Mild Steel

Tilt angle	Suitable to site
Fasteners	SS 304
Design Wind Speed	120 ph

#### 5.4. PVC CU. CABLES

- a) Sizes of cables between 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 power plant to the minimum. Cables are flexible and are used with annealed electrolytic grade copper conductors. They are suitable for outdoor and for 1000VDC application

#### 5.5. TECHNICAL SPECIFICATION OF PV CABLES

Parameters	Specifications
Type	PVC insulated and Sheathed
Material	Copper
Working voltage	Up to 1100 V
Test voltage	650V/1.1Kv
Color	To suit Red, Black, Blue
Temperature	-15 Degree C to +70 Degree C

#### 5.6. SOLAR ON- GRID INVERTER

- a) The PCU consists of in-built charge controller and bi-directional inverter to supply continuous power to the dedicated load with support to the load coming either from the solar array, battery bank, Grid Power in order of preference. The sine wave inverter generates a sinusoidal AC voltage with an exceptionally precise voltage and stabilized frequency. The inverter is protected against overload and short circuit.

#### 5.7. JUNCTION BOX

- a) In the Junction boxes, individual module strings are bundled and safely routed to the inverter. It is a combination of an exact, well-organized string monitoring system and a safety concept adapted to the PV technology.
- b) These junction boxes are weather proof outdoor suitable and are IP 65 rated, making it ideal for long-term use in PV systems. In addition, the direct connection between the strings and the spring clamp connectors ensures a durable and safe installation.

#### 6.0 EARTHING PROTECTION

6.1. Earthing: The array structure of the PV yard will be grounded properly using adequate number of earthing kits. All metal casing / shielding of the plant shall be thoroughly grounded to ensure safety of the power plant. Total height of the floor to roof is 15 feet.

6.2. Lightning: The SPV Power Plant shall be provided with lightning & over voltage protection. The main aim in this protection shall be to reduce the over voltage to a tolerable value before it reaches the PV or other sub system components. The source of over voltage can be lightning, atmosphere disturbances etc. Metal Oxide varistors shall be provided inside the Array Junction Boxes. In addition, suitable MOV's also shall be provided in the Inverter to protect the inverter from over voltage.

**TYPICAL BILL OF MATERIAL:**

<b>Description of Supply Items - 10.26kW3ph</b>	<b>Make</b>	<b>UoM</b>	<b>Quantity</b>
Solar PV module: 540 Wp,	Tata Power Solar - TC/TP/equivalent	no	
Module mounting structure -RCC/ GI Structure	TPS Approved Vendors	set	
AJB, 2 I/P 2 O/P, WITH FUSE, SPD TYPE II	Trinity// TPS Reputed vendors	no	
Grid Connect Solar Inverter (1X10kW,415V AC, 50Hz, MPPT), DC:AC=1.3 max	Growatt/Solis	no	
ACDB with SPD 3ph	TPS Approved Vendors / Eligant / Eqv.	set	
1C X 4 Sq.mm. EB XLPE Cu.cable	Siechem/KEI/TPS Approved Vendors	m	
4CX6sqmm Cu Cable	Siechem/KEI/TPS Approved Vendors	m	
MC4 T BRANCH CONNECTOR (+VE) 2 IN 1 OUT, 1500VDC	Siechem/KEI/TPS Approved Vendors	m	
MC4 T BRANCH CONNECTOR (-VE) 2 IN 1 OUT, 1500VDC	Siechem/KEI/TPS Approved Vendors	m	
"Earthing kit 1.5M, 14.2mm dia, copper B	TPS Approved Vendors	set	
LIGHTENING ARRESTOR- HEIGHT 2 Mtrs CONVE	TPS Approved Vendors	set	
1CX10 sq mm AL single strand Earthcable	TPS Approved Vendors	m	
Installation kit (Comm. Cable etc)	Tata Power Solar	set	
MC-4 Cable Couplers (Male &	TPS Approved Vendors /	no	

Female Pairs)	Eligant / Eqv.		
HA product- 2 Way 3 Gang Convertor	TPS Approved Vendor	No	
HA product- Smart Plug with IR Blaster	TPS Approved Vendor	No	
PACKING CARTON,	TPS Approved Vendor	No	

Note: UoM- Unit of Measurement. Quantity of each item above has to be duly filled by the bidder while submitting the technical bid.

On letter Head

Form No. 1

**TENDER FORM**

**(Supply, Installation, Testing and Commissioning of 15 KWp through Solar PV System at BR Hills Wild Honey Bee Cluster's CFC, BR Hills, Yellandur Taluk, Chamarajanagara District, Karnataka)**

Tender Form is issued to:

Date of issue of tender form:

Signature of issuing authority

Terms and Conditions:

- 1) The minimum turnover of the tenderer firm for the last 3 years should be above Rs. 50.00 lakhs.
- 2) The bidder firm should have minimum 3year experience supply, installation, testing and commissioning of 15 KWp through Solar PV System and necessary evidence in the form of Work Orders needs to be furnished.
- 3) Bidder should supply, installation, testing and commissioning of 15 KWp through Solar PV System at the cluster's CFC in BR hills
- 4) The tender should be submitted in the prescribed tender form.
- 5) Tenderers must submit Pan Card, Audited IT Return and balance sheet for last three years, GST Registration Certificate & last month Challan of Professional Tax Return.
- 6) Tender form can be obtained from the office of ATREE provided above on any working days between 1st – 6<sup>th</sup> June 2023 (01-05-2023 and 06-05-2023) from 10 AM to 5 PM by payment of Rs. 1,000/- (Rupees One Thousand Only). Tender forms can also be downloaded from the website [www.atree.org/tenders](http://www.atree.org/tenders) by transferring the tender form fees of Rs. 1,000/- to A/c No.: 9921201007496; IFSC Code: CNRB0000425; Bank: Canara Bank, Hebbal branch.
- 7) Tender form should be submitted in two separate envelopes containing Technical Bid and Financial Bid along with earnest money deposit (EMD) of Rs. 22,000/- (Rupees Twenty-two Thousand Only) at the above given address Dr. Siddappa Setty, Fellow, Centre Convener, Centre for Environment and Development, Royal Enclave, Srirampura,

Jakkur Post, Bengaluru-560064; siddappa@atree.org on or before 05.00 pm of 17th June 2023. EMD should be paid through DD purchased in favour of “Ashoka Trust for Research in Ecology and the Environment, payable at Bengaluru”. Exempted bidder should submit the supporting documents. The tender received will be opened in the presence of the Cluster’s Working Committee on 22nd June 2023 at 3.00 pm.

- 8) Tenderers should submit their Bid in Two Cover – Technical Bid and Financial Bid. Envelope containing Technical Bid should be super-scribed as TECHNICAL BID and Envelope containing Financial Bid should be super-scribed as FINANCIAL BID. Both the Bids should be sealed in one envelope super scribed as Tender for “**Supply, Installation, Testing and Commissioning of 15 KWp through Solar PV System**” at BR Hills Wild Honey Bee Cluster’s CFC, BR Hills, Chamrajnagar, Karnataka.
- 9) Tenders received without EMD will not be accepted. EMD can be paid through DD purchased in favour of “ATREE, Bengaluru” payable at Bengaluru. Exempted bidder should submit relevant supporting documents (Declaration, Certificate of Exemption with Udyog Aadhar Number). Only NSIC or MSME certified bidders will be exempted from paying EMD.
- 10) The Technical Bid will be opened and considered first. The financial Bid of only eligible firms/agencies will be opened.
- 11) Tax Deducted at Source (TDS) and other taxes will be deducted as per norms from the payments.
- 12) The bidder firm should submit tender for the whole works. Tender for partial works will not be accepted.
- 13) Technical Bid/ Financial Bid cannot be withdrawn after opening it. EMD can be forfeited in case of withdrawal of bid or not completing the work.
- 14) The Prices quoted must be on FOB basis. The tender Prices will be fixed and inclusive of taxes and statutory duties applicable, packing, forwarding, freight, insurance and other charges as applicable.
- 15) The rates quoted by the selected firm and approved shall remain valid throughout the period of contract and requests to increase the rates for any item(s) during the currency of the contract shall not be considered.
- 16) If the items supplied are not found as per specifications or unsatisfactory the payment of whole or equivalent amount can be withheld.

- 17) The supply of items, its installation and commissioned shall be made at Cluster's CFC building, BR hills, Chamarajanagara within one months (30 days) from date of purchase order.
- 18) Not being blacklisted by Govt. Of India/Public Sector/Private Sector for which they have executed their works.
- 19) ATREE reserves the right to accept the bid partially/in full or may reject any or all the bids without assigning any reason.
- 20) The maximum time frame given for the installation and commissioning of the solar plant at the CFC building is 30 days.
- 21) All disputes arising in connection with the contract shall be within the jurisdiction of the Bangalore Court.
- 22) The total approved cost for the supply, installation and commission of 15 KWp through Solar PV plant at the CFC is Rs. 11,00,000/-. Thus, financial bid of tendered firm should not exceed the Maximum limit of Rs 11,00,000/- (Rupees Eleven Lakhs Only).

Declaration: -

I do here by agree to abide by all the terms and conditions mentioned above.

(Signature of the authorized person/proprietor)

Name:

Designation:

Name of firm:

Phone/Mob No:

Seal of the firm

On letter Head

Form No. 2

**TENDER FORM**

**(Supply, Installation, Testing and Commissioning of 15 KWp through Solar PV System at BR Hills Wild Honey Bee Cluster's CFC, BR Hills, Yellandur Taluk, Chamarajanagara District, Karnataka)**

Tender Form issued to : \_\_\_\_\_

Date of issue of tender form :- \_\_\_\_\_

Signature of issuing authority

Details of firm/agency:

1. Name of Firm/Agency:
2. Registered Address of Firm/Agency:
3. Name & Phone No. of co-coordinator/contact person:
4. Type of Firm/Agency:
5. Registration No:
6. Year of Commencement of work of the Firm/Agency:
7. Turnover of Firm/Agency for the year 2021-22 or 2022-23
8. Details of Human resources: (Man power with the firm/Agency)
9. PAN/GST of the Firm/Agency: (Please enclose photo copy)
10. Description of construction activities done by Firm/Agency in past (Please enclose copies of work order/photographs which should be verified by not less than the rank of Executive Engineer or equivalent thereof)
11. Action plan for present activity
12. Affidavit of not being blacklisted by Govt. Of India/Public Sector/Private Sector for which they have executed their works.
13. Other details, (If any):

Miscellaneous:

1. The minimum turnover of last year (2021-22 or 2022-23) of the Bidder Firm/Agency should be Rs. 50.00 Lakhs.

2. The Bidder Firm will submit layout plan, design and detailed estimate for the proposed power plant.
3. An earnest money of Rs. 22,000/- (Rupees Twenty-two thousand only) can be deposited at the following address Ashoka Trust for Research on Ecology and Environment (ATREE), Royal Enclave, Srirampura, Jakkur Post, Bengaluru, Karnataka 560064, up to 5.00 PM of 17th June 2023. Tenders received will be opened in the presence of the Working Committee on 11<sup>th</sup> May 2023 at 3.00 PM. Earnest money can be paid through DD purchased in favour of “ATREE, Bengaluru” payable at Bengaluru. Exempted bidder should submit the supporting documents.
4. Balance Sheet duly Certified by Chartered Accountants for the three years (FY 2020-21, 2021-2022, 2022-23) will invariably be enclosed along with technical bid.
5. Copies of audited Income Tax returns for the three years (FY 2020-21, 2021-2022, 2022-23) to be enclosed with technical bid.
6. Copy of PAN/GST Certificate required to be enclosed with technical bid.
7. The profile and following details of bidder firm/agency along with photograph, paper cutting, copy of work order and last 3 years completion in supplying, installing, testing and commissioning of 15 KWp through Solar PV System will be submitted as under:

Year	Details of projects executed	Duration	Project executed place
2020-2021			
2021-2022			
2022-2023			

8. Detail of Earnest Money Deposit (EMD):
  - a. D.D. No.:
  - b. Date:
  - c. Amount:
  - d. Name of the issuing bank:
9. If the Tender Form is downloaded from website [www.atree.org/tenders](http://www.atree.org/tenders) then an amount of Rs 1,000/- in favour of “ATREE, Bengaluru” is essential to be deposited or transferred to the bank account details given above. If transferred then the transaction details should be enclosed with the bid. If done by Demand draft (DD) then details should be furnished below
  - a. D.D. No.:
  - b. Date:
  - c. Amount:

d. Name of the issuing bank:

Declaration: I hereby declare that the information given in the bid is true and correct and I hereby accept all the terms and conditions.

Place:

Date:

Signature of the authorized person

Name:

Designation:

Name of firm & address:

Phone / Mobile No:

Email Id:

Seal of the firm

On letter head

Form No. 3

**TENDER FORM**  
**(Supply, Installation, Testing and Commissioning of 15 KWp through Solar PV System at BR Hills Wild Honey Bee Cluster's CFC, BR Hills, Yellandur Taluk, Chamarajanagara District, Karnataka)**

Tender Form issued to:  
Date of issue of tender form:

Signature of issuing authority

**FINANCIAL COST**

Sl. No.	Supply, installation, testing and commissioning of 15 KWp through Solar PV System (All inclusive)	Amount Quoted	Percentage of high or less
1.			

Total amount in words:

Place:  
Date:

Signature of the authorized person

Name:  
Designation:  
Name of firm & address:  
Phone /Mobile No.:  
Email Id:  
Seal of the firm:

On letter head

Form No. 4

**TENDER FORM**  
**(Supply, Installation, Testing and Commissioning of 15 KWp through Solar PV**  
**System at BR Hills Wild Honey Bee Cluster's CFC,**  
**BR Hills, Yellandur Taluk, Chamarajanagara District, Karnataka)**

Tender Form issued to:

Date of issue of tender form:

Signature of issuing authority

1. Name of work: **supply, installation, testing and commissioning of 15 KWp through Solar PV System**

S.no	Description of work	Timeline (From date of issuance of contract)
1	Supply of equipment to the CFC	First week
2	Installing the equipment	By the end of third week
3	Testing and Commissioning of the plant	By the fourth week

Note: Thus, the total time for completion of the work is 30 days

2. Mode of payment:

- a. Payment will be released as per the scheduled quality executed. The measurement will be verified.
- b. Payment will be released after statutory reduction of tax component as per Government of Karnataka notification.