**BAIF Development Research Foundation**

**Techno-Commercial Bid**

Tender notice: BAIF Lakkihalli/Jan 02/2024-25 Last Date for Submission: January 30, 2025

**Tender Release date: January 15, 2025**

Tender for supply, installation, and commissioning of Offgrid and on grid Solar PV Power Systems for Agrivoltaics (Agri PV) applications at BAIF office, Lakkihalli Tiptur District; location as per the address provided in the technical document.

**A. Commercial terms:**

| SN | Particulars | Information by bidder |
|---|---|---|
| 1 | Name of the bidder | |
| 2 | Address of the Registered Office | |
| 3 | Address of the branch / office quoting against the Tender | |
| 4 | Contact person name and number | |
| 5 | E-mail ID | |
| 6 | Year of commencement of business | |
| 7 | Whether experience certificate is enclosed (Work Completion Certificates of single and cumulative works must be enclosed as per eligibility criteria). | |
| 8 | Whether documentary proof of annual turnover is enclosed (IT returns / P&L / balance sheet / auditor's Report of 2021-22, 2022-23 and 2023-24). | |
| 9 | Permanent Account Number (PAN) (Enclose copy) | |
| 10 | GST Registration Number (Enclose copy) | |
| 11 | Certificate of incorporation / Registration No. (under companies Act) (Enclose copy) | |

| SN | Particulars | Information by bidder |
|---|---|---|
| 12 | Whether the bidder is a Manufacturer or Authorized Dealer / Supplier (Enclose authorization / dealership certificate). | |
| 13 | Whether Sole Trader/ Partnership / Private Limited Co. or Public Limited Co. | |
| 14 | Whether the bidder is an employee or a relative of an employee working in BAIF/BISLD. If so, please mention the name, designation and department. | |
| 15 | Name of the Banker (if any) | |
| 16 | Whether registered under MSEMED Act (Enclose copy). | |
| 17 | MSME status of social category (SC/ST/OBC/General) | |
| 18 | MSME Gender Status (Male/Female) | |
| 19 | Whether the bidder has understood the work, scope and conditions. | |

**B. TECHNICAL SPECIFICATIONS FOR** Solar PV

| SN | Technical Specifications | Vendor Response Yes / No |
|---|---|---|
| 1 | **Scope:** Installation and commissioning of Solar PV with supply, installation, commissioning and after-sales service. | |
| 2 | **Location:** At BAIF office, Lakkihalli Tiptur District; location as per the address provided in the technical document. | |
| 3 | **Quantity required:** Immediate requirement of<br><br>PART A - 90 kWp Solar Standalone On grid PV System with customised Ground Mounted MMS with 9.5 m pitch (Details of the same given in the Technical Specifications)<br><br>Part B<br><br>B1 - Standalone Climate Smart village model with 50 kWp Solar PV System for operating two 12 hp and one 7.5 hp Submersible AC Pumps during day time and an | |

| SN | Technical Specifications | Vendor Response Yes / No |
|---|---|---|
| | inverter of 50 kW load hybrid grid system with Standard Ground Mounted MMS with 9.5 m pitch.<br><br>B2 - Standalone Climate Smart village model with 40 kWp Solar PV System for operating two 5 hp and one 7.5 hp Submersible AC Pumps during day time and an inverter of 30 kW load hybrid grid system with Standard Ground Mounted MMS with 9.5 m pitch.<br><br>PART C- 20 kWp Solar Pumping system (dual operation) for operating two 7.5 hp Submersible AC Pumps during day time with structure mounted on existing polyhouse.<br><br>At BAIF office, Lakkihalli Tiptur District. | |
| 4 | DETAILED TECHNICAL SPECIFICATIONS FOR SOLAR PV<br>Please check **Annexure 1** and give your response | |
| 5 | **Installation and Commissioning:**<br>a) Installation and commissioning of Solar PV to be done by the company/manufacturer's authorized and trained personnel.<br>Vendor should ensure that each component should be transported by the vendor to the respective locations and complete installation, inclusive in the cost as quoted in the tender has to be ensured. | |
| 6 | **Warranty:**<br>Complete system shall be warranted for a standard period from the date of commissioning for malfunctioning, manufacturing defect, poor workmanship and improper installation.<br>After the warranty period is over, the product should be supported through Annual Comprehensive Maintenance Contract (CMC) for minimum five years from the date of installation. BAIF reserves the right to enter into a CMC agreement with the successful tenderer / OEM after expiry of the warranty period at the above-mentioned rate and the payment for CMC charges will be made annually before rendering of CMC Services of the relevant CMC period. Performance Bank Guarantee of the successful tenderer shall be forfeited if it fails to accept the CMC contract when called upon by BAIF. CMC should include the cost of preventive and breakdown maintenance. | |
| 7 | **Annual Maintenance Contract (AMC):**<br>**The Defect Liability Period is for 12 months** from the date of commissioning of the Solar PV Plant. The Annual Maintenance Contract (Quoted separately) of the Solar PV Plant will commence immediately after the Defect Liability Period. The duration of the AMC will be 5 years from the date of commissioning of the Solar PV plant. The Service Engineer of the selected bidder should visit the site once in every three months for preventive maintenance of the Solar PV Plant. Periodic Cleaning of Solar Modules in not within the scope of the AMC. | |

| SN | Technical Specifications | Vendor Response Yes / No |
|---|---|---|

The scope of the AMC activities will be as under:

| Sr. No. | Activity | Frequency |
|---|---|---|
| 1. | Visual Inspection of Modules | Every 4 months |
| 2. | Checking string voltages of modules | Every 4 months |
| 3. | Pump Controller/Inverter Fan checking and cleaning | Every 4 months |
| 4. | Checking DC SPDs | Every 4 months |
| 5. | Checking the DC cable connections from Module to Inverter/ Pump Controller / DCDB | Every 4 months |
| 6. | Checking and tightening of AC Connections at inverter input | Every 4 months |
| 7. | Checking and tightening AC Connections at Inverter Disconnect Panels, Solar LT panel | Annually |
| | Checking Battery Connections/ Battery health/Battery Fuses etc. | Every 4 months |
| 8. | Checking AC SPDs in IDPs | Every 4 months |
| 9. | Cleaning of IDP and Solar LT panel | Annually |
| 10. | Checking voltages and current in all Panels and Inverters | Every 4 months |
| 11. | Checking and tightening connections for structural/body earthing, lightening arrestor, inverter and panels | Annually before the monsoon season |
| 12. | Checking/ tightening of Module bolts | Annually before the monsoon season |
| 13. | Random Check of Module Mounting structure | Every 4 months |
| 14. | Earth pit inspection and testing | Every 4 months |
| 15. | Remote Monitoring system | Every 4 months |
| 16. | Plant Fitness report | Every 4 months |
| 17. | Any unscheduled repair maintenance | As per requirement |

| SN | Technical Specifications | Vendor Response Yes / No |
|---|---|---|
| | a. The selected bidder must carry out the activities under repair and replacement as under. Repair or replacing the damaged equipment's such as inverters/Pump controller within 14 days from the date of acceptance of defect by the OEM (the selected bidder must register the complaint and ensure that the warranty is enforced).<br>b. Replacing the defective solar module within 14 days from the date of acceptance of defect by the OEM (The Selected bidder must register the complaint and ensure that the warranty is enforced).<br>c. Replacing the faulty Cables/ MCBs / fuses/ Connectors / SPDs so that the system becomes safe for operating it within 7 days.<br>d. The penalty applicable for non-rectification of the fault beyond 30 days will be @₹3,000/- (Rupees Three Thousand only) per day. However, the total accumulated penalty during the year shall be sealed to the maximum of 10 % of the annual charge of the AMC.<br>e. Replacing battery stack/Battery cells within 30 days.<br>The bidder must ensure that the system has a maximum down time of not more than 2 days and should provide spare equipment till the replacement or repair of the component is undertaken.<br>Note: The selected bidder must have all necessary tools and equipment's duly calibrated by accredited laboratories during the AMC. | |
| 8 | **Required civil work and pit digging under the scope of the vendor** | |
| 9 | **Additional conditions:**<br>a) Training to local person for basic Installation and repair maintenance<br>b) Provide extra spare and toolkit to the locally trained persons.<br>c) Share the required pre-requisites with BAIF team, if any<br>d) Vendor can apply for both the part of the tenders PART A and PART B or can apply for any one of the part. The technical and financial comparative will be done PART wise. | |
| 10 | **Delivery Timeline**<br>Delivery /Commissioning/Installation of goods/ service to be done by the successful tenderer within the stipulated time **as provided in special terms and conditions mentioned in this tender document BUT NO LATER THAN MARCH 25th, 2025.** | |
| 11 | **Payment Schedule**<br>Kindly refer to Price Bid format in "Annexure II" for details: | |

| Sr. No. | Deliverables for on grid | Payment Terms |
|---|---|---|
| 11.1 | After submission of all technical documents, drawings, bar chart and | 10% of project price within 7 (seven) days of submission of bills duly verified and certified by BAIF Official / Consultant along with necessary supporting documents and subject to deposit of security deposit. |
| 11.2 | On installation of Solar Module Mounting structure, walkway, lifeline, safety rails, earthing and lighting arrestor systems. | 10% of project price within 7 (seven) days of submission of bills duly verified and certified by BAIF Official / Consultant along with supporting documents. |
| 11.3 | On installation Inverter Disconnect Panels, Solar LT panel, Solar Generation Metering Panel, trenching and laying of AC Cables connecting Inverter Disconnect panel to Solar LT Panel, Solar LT Panel to Solar generation metering panel and from Solar Generation Metering Panel to Main LT Panel. | 10% of project price within 7 (seven) days of submission of bills duly verified and certified by BAIF Official / Consultant along with supporting documents. |
| 11.4 | On Supply of Solar Modules and Solar Inverters, Battery Stack etc /Pumps and Pump Controllers | 60% of project price within 7 (seven) days of submission of bills duly verified and certified by BAIF Official / Consultant along with supporting documents. |
| 11.5 | On Installation of all equipment's. | 5% of project price within 7 (seven) days of submission of bills duly verified and certified by BAIF official / Consultant along with supporting documents. |
| 11.6 | On Commissioning of Solar PV Systems (with delivery of water at CR8 Campus for Part B and issue of work completion certificate from BAIF Engineer-In-Charge. | 5% of project price within 7 (seven) days of submission of bills duly verified and certified by BAIF official / Consultant along with supporting documents. |
| 11.7 | The selected bidder has to raise a single invoice at the end of March of every year after completion of three Preventive Maintenance visits. | 100% upon submission of the invoice with Preventive Maintenance and Repair Maintenance reports at the end of the financial year. |

**Note**: All payments will be made in Indian Rupees

**Annexure 1**

**TECHNICAL SPECIFICATIONS FOR SOLAR PV**

**FOR PART A- 90 kWp on grid Solar PV System, PART B- 50 kWp and 40 kWp off grid Solar PV with Pumping Systems and backup facility (CSV model), PART C- 20 kWp on grid SOLAR PV SYSTEM for pump operations with installation on polyhouse.**

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DATE OF ISSUE: **January 15, 2025**

**SECTION: 1**

**1. Security Deposit / Performance Guarantee**

A non-interest-bearing Security Deposit (either in the form of Demand Draft/Pay order or RTGS/NEFT/IMPS transfer or by way of Bank Guarantee issued by any schedule bank in favour of BAIF Development Research Foundation of **5% of the Basic Contract value (i.e. Order value excluding taxes)** will be required to be deposited with the Company by the successful tenderer within 10 days of getting work order from the Company. This security deposit will be refundable after three months on completion of defect liability period of 12 months from the date of successful completion of work/contract period/extended contract period. In the event of non-performance of the contract, the security deposit will be forfeited and the contractor will be blacklisted for future tenders. Security deposit has to be paid by the selected vendors.

The Security Deposit / Retention Money shall remain with the Owner as a security for satisfactory execution and completion of the Work(s). Owner will be at liberty to deduct an appropriate amount from the Security Deposit / Retention Money for damages (liquidated or otherwise) and other dues and recoveries from Bidder under this Contract and the amount by which Security Deposit / Retention Money is reduced by such appropriations, will be made by further deductions from subsequent bills of the bidders to make up for the Security Deposit / Retention Money.

**SECTION 2:**

**PART A:**

**Part A is divided in to three parts on the basis of type of solar panels and mounting type the total capacity of On Grid PV Plant of 90 kWp is divided in to three models each with 30 kWp.**

**PART A - Project Objective**

At BAIF campus we want to demonstrate different models with variations in height and type of solar panels with which we can generate some data on these models on cost implications and crop economics.

**PART A- Project Scope**

The scope of the project is as follows:

- The System will be a ~ 3 x 30 kWp Solar PV System
- The system will be 3 separate 3 phase On Grid inverters with minimum AC output of 25 kW.
- The Ground mounted solar structure will be a Customized MMS structure as mentioned in the Technical Specifications given.
- The bidder should design, supply, install, test and commission the minimum 3 x 30 kWp DC / 25 kW AC Solar PV Plant and connect the same to grid as per the evacuation system decided with the Utility.
- The bidder should submit all the design details to the client or to the client's consultant.
- The bidder should connect the plant to the Utility Grid as per the relevant state policy.
- All Material /equipment supplied should be as per relevant IS code.
- The Metering arrangement should be as per the requirements of the Utility.
- Application for new connection or modification of existing connect charges will be paid as per actual to contractor by BAIF.

**PART A - System Requirement**

- 3 phase, 4 wire, 50Hz minimum 3 x 30 kWp / 25kW AC On Grid Systems
- 3 separate inverters of minimum 25 KVA
- Ground mounted system
- For the distance from GTI to termination to grid is around will be calculated on actual basis hence (i.e. distance for all 3 invertors) provide per metre cost for the same.

System type A1:

- 30 kWp/25kW AC
- Solar Modules :Mono Crystalline Topcon Bifacial – Minimum 580Wp
- Standard MMS with 9.5 m pitch, 10 degree south facing
- Minimum 1.5 m height of module at the lower end.

System Type A2:

- 30 kWp/ 25kW AC
- Solar Modules :Mono Crystalline Mono PERC – Minimum 545Wp
- Standard MMS with 9.5 m pitch, 10 degree south facing
- Minimum 2.1 m height of module at the lower end.

System type A3:

- 30 kWp/ 25kW AC
- Solar Modules : Mono Crystalline Mono PERC – Minimum 545Wp
- Standard MMS with 9.5 m pitch, 10 degree south facing
- Minimum 1.5 m height of module at the lower end.

**PART A - Scope of Work**

The scope of work and services includes but is not restricted to the following:

A. Design, Supply, Installation, Commission testing of the a 3 x 30kWp/ 25 kW AC Solar PV Systems

- Solar Modules of adequate quantity to meet the design requirements.
- The Solar Module Mounting structure adequately designed to meet the technical requirements along with necessary mounting rails, clamps, nut bolts, etc.
- Solar DC Copper Cables
- LT Power Cables including end terminations and required accessories for AC & DC power.
- Inverter Disconnect Panel/s suitable rating of 4 Pole MCB/ MCCB/s with AC SPD's with phase indication lamps, brass or SS Double compression Glands for Armoured cables and PVC Glands for Flexible copper cable. Separate Inverter Disconnect panels should be provided for each inverter supplied.
- 4 core copper cables to be provided from Inverter to Inverter disconnect Panels. All output cables from Inverter disconnect panels to Solar LT Panel should be XLPE Aluminium Armoured cables.
- Solar L.T Panel with Phase Indication Lamps, Required capacity MCCB's for incoming and outgoing cables. Digital Panel Meter of 0.5 class accuracy with PF, Voltage, Current, kWh, kW should be provided.
- Remote Monitoring System with Communication cable.
- ESE Lighting Arrestor and Protection system, earthing kits and earthing systems.
- PVC Pipe, trenches, Cement Pipes and accessories as required by design.
- Water piping along with module cleaning equipment including hose pipes and water outlets at convenient locations for regular cleaning of the Solar PV Plant. The client will provide water at a single point on the ground floor of the building.
- Fire extinguishers, danger plates, name board etc to be provided as per Electrical Standards.
- Transportation, loading, unloading of all materials, equipment's etc.
- Training of BAIF nominated executives and technicians.
- Testing equipments/material for maintenance, monitoring and regular upkeep of the Solar PV Power Generating system.
- Fuses and other protection devices.

**Part B is OFF GRID/ HYBRID/ AC/COUPLED PV Plant of 50 kWp and 40 kWp climate smart village model**

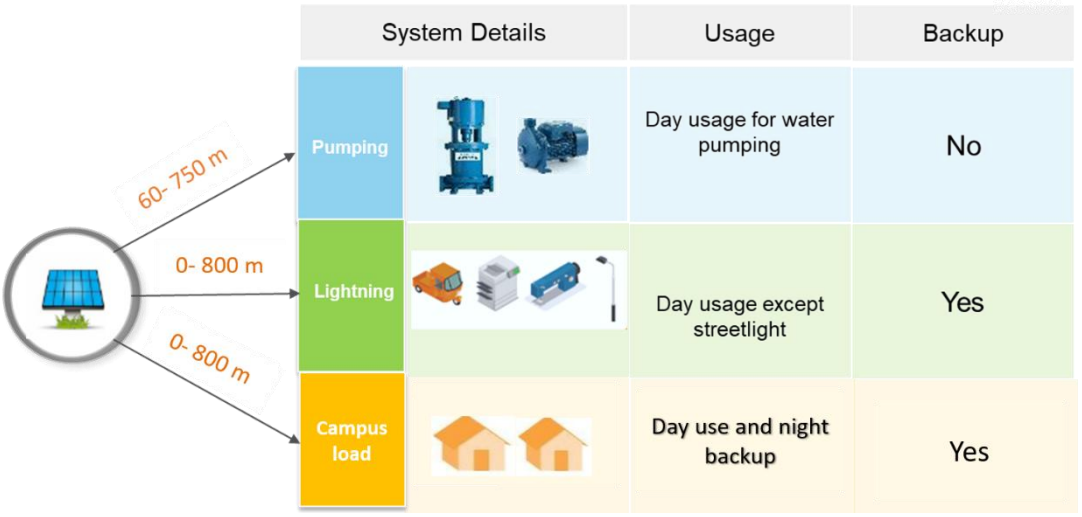
**PART B: Project Objective**

At BAIF office Lakkihalli Tiptur District. BAIF aims to demonstrate various models, one such model is Climate Smart Village (CSV) model. The objective of this model is to showcase off grid solar system can run various productive loads, pumping system as well as provide lightning to households and other commercial load based on demand.

**PART B : Project Scope**

The village is connected to national grid with a single-phase supply. The grid supply is highly unreliable, with 6-8 hours of daily power cut. Sometimes during heavy rain, the grid power is not available for few days.

With support of this model BAIF is planning to provide reliable and clean energy to following loads under Climate Smart Village (CSV) - 1 model.




| System Details | | Usage | Backup |
|---|---|---|---|
| Pumping | | Day usage for water pumping | No |
| Lightning | | Day usage except streetlight | Yes |
| Campus load | | Day use and night backup | Yes |

- 3 Nos (2 Pump of 12 Hp and 1 Pump of 7.5 Hp, AC, three phase 415V) solar powered pumps used for pumping water during daytime
- Hostel, Canteen and main building having load of 8,000 watts (single phase/three phase 230/415V) runs during daytime and 6 to 9 hours during evening with limited loads.
- 30 w streetlight (single phase 230v) around 50 numbers spread at campus and roads in around 800 m. Run time of around 8hr starting from 6:30/7:00 pm with power saving mode (sensor based).
- E-vehicle charging station for 2W, 3W and 4W (single phase 230v, three phase 415v) 2 each number 5 hrs during day time. (Excluding EV charger and its mounting cost)
- Productive load/s such as chaff cutter, nursery, and small pump of 2 Hp the total load of 4,500 watts for day load operations.

## ***CSV 1:- List of loads and their usage***

| S. No. | Load operative | Loads | Rating (Watt) | Specification | Quantity | Distance from Solar PV | Operating hr |
|---|---|---|---|---|---|---|---|
| 1 | **Microgrid** | Hostel | 3,000 | Light, fan, phone, laptop | 1 | 800 m | 6pm-11pm |
| 2 | | Canteen | 350 | Light, Fan | 1 | | 9am-6 pm |
| 3 | | Main Building | 4,500 | Light, Fan, laptop, printer | 1 | | 9am-6 pm |
| 4 | | E Rickshaw - | 750 | 1 Phase, 230VAC | 2 | | 5 hr (Day time) |
| 5 | | EV Charging | 3,700 | 3 Phase, 415VAC | 2 | | 5 hr (Day time) |
| 6 | | Streetlight (In Campus) | 30 | | 50 | | only for night (6:30 pm (8 hr) Power saving mode/Sensor based |
| 7 | | Chaff cutter (3Hp) | 2,250 | 3 Phase, 415VAC | 1 | | 3 hr Day load |
| 8 | | Pump – 2Hp | 1,500 | 1 Phase ,230VAC | 1 | | 2 hr Day load |
| 1 | **Solar Drive** | Pump- 12 Hp | 9,000 | 3 Phase, 415VAC | 1 | 60 m | 5 hr Day load |
| 2 | | Pump Water Supply 12 Hp | 9,000 | 3 Phase, 415VAC | 1 | 350 m | 5 hr Day load |
| 3 | | Pump - 7.5 Hp | 5,625 | 3 Phase, 415VAC | 1 | 750 m | 5 hr Day load |

Under Climate Smart Village (CSV) - 2 model following loads interventions are planned

- 2 Nos (1 Pump of 7.5 Hp and 2 Pumps of 5 Hp, AC, three phase 415V) solar powered pumps used for pumping water during daytime
- Households and staff quarters having load of 9,000 watts (single phase/three phase 230/415V) runs during daytime and 6 to 9 hours during evening with limited load. (Backup Supply near existing govt. meter, the cost of internal wiring is in end user scope).
- 30 w streetlight (single 230v) around 50 numbers spread on roads in around 600 m. Run time of around 8hr starting from 6:30/7:00 pm with power saving mode (sensor based).

## ***CSV 2:- List of loads and their usage***

| S. No. | Load operative | Loads | Rating (Watt) | Specification | Quantity | Distance from Solar PV | Operating hr |
|---|---|---|---|---|---|---|---|
| 1 | Microgrid | Staff Quarters | 5,000 | Light, Fan, laptop, 1500w Geyser, 800 w Dry Iron | 1 | 50 m | Whole day |
| 2 | | Household | 3,400 | 34 HH in Hour village with Backup 100W Power | | 250 m | |
| 3 | | Streetlight at village | 30 | 1 Phase ,230VAC | 50 | 600 m | only for night (6:30 pm (8 hr) Power saving mode/Sensor based |
| 4 | Solar drive | Pump - 7.5 Hp | 9,000 | 3 Phase, 415VAC | 1 | 100 m | 5 hr Day load |
| 5 | | Pump 5 Hp | 3,750 | 3 Phase, 415VAC | 2 | 150 m | 5 hr Day load |

**PART B - System Requirement**

The proposed off grid/ Hybrid / AC & DC Coupled system with centralized solar generation should provide reliable power to productive loads, households, and street lights. The system should be designed in such way that, the load requiring storage will be powered through an inverter with back up and motors loads without backup requirement will be powered through Solar VFD / Controller.

The inverter and other motor loads should be connected to the centralized PV arrays though an intelligent load controller, which will ensure 100 % utilization of Solar array. The system should have IoT enabled remote monitoring and control system for performance and impact monitoring.

**FOR CSV-1 Model**

- 3 phase, 4 wire, 50Hz minimum 50 kWp DC Capacity with minimum 40kW AC Off Grid/ Hybrid/ AC Coupled inverter system
- Ground mounted system with minimum 1.5 m height of module at the lower end
- Solar Modules :Mono Crystalline PERC – Minimum 545Wp
- Standard MMS, single column 1R x 1C grid, 10 degree south facing
- Modules to be distributed over 5 Rows
- Distance between R1-R2 - 11.5 m, R2-R3 – 10.5 M, R3-R4 - 9.5 and R4-R5- 8.5m

- Minimum useable battery capacity -80KWh (80 units) battery should provide mentioned unit backup.

**FOR CSV-2 Model**

- 3 phase, 4 wire, 50Hz minimum 40 kWp DC Capacity with minimum 30kW AC Off Grid/ Hybrid/ AC & DC Coupled inverter system
- Ground mounted system
- Solar Modules :Mono Crystalline PERC – Minimum 545Wp
- Special MMS , single column 1R x 1C grid, 10 degree south facing
- Minimum 4 m height of module at the lower end.
- Modules to be distributed over 5 Rows
- Minimum Distance between R1-R2 - 7 m, R2-R3 – 6 M, R3-R4 – 5. Shadow analysis should be down and row distances should be adjusted so that there is no shadow during any day of the year between 9.30 am to 5.00 pm.
- Minimum useable battery capacity -50KWh (50 units) battery should provide mentioned unit backup.

## Location


| Site | GPS Coordinates | Comments |
|---|---|---|
| Location for panel installation | 13°12'01"N 76°23'42"E | White marked area |
| Village location | 13°12'09"N 76°23'41"E | Red marked area |
| Main Building | 13°11'55"N 76°23'42"E | Yellow marked area |
| Hostel | 13°11'56"N 76°23'40"E | Yellow marked area |
| Pump 1 – 12 hp | 13°11'51"N 76°23'39"E | |
| Pump 2 – 12 hp | 13°11'57"N 76°23'44"E | |
| Pump 3 – 7.5 hp | 13°11'44"N 76°23'51"E | Green circle |
| Pump 4 – 7.5 hp | 13°11'59"N 76°23'40"E | |
| Pump 6 – 5 hp | To be installed within 200 m | |
| Pump 7 – 5 hp | To be installed within 200 m | |
| Pump 8 – 2 hp | 13°11'52"N 76°23'41"E | |

**PART B- Scope of work**

The scope of work and services includes but is not restricted to the following:

A. Design, Supply, Installation, Commission testing of the Off grid/ Hybrid/ AC Coupled Solar PV System

- Solar Modules of adequate quantity to meet the design requirements.
- The Solar Module Mounting structure adequately designed to meet the technical requirements along with necessary mounting rails, clamps, nut bolts, etc.
- Off/hybrid / AC Coupled Inverters with Surge Protection Devices (SPD) either within the inverter or externally mounted on the DC Distribution Box (DC DB).
- Solar DC Copper Cables
- LT Power Cables including end terminations and required accessories for AC & DC power.
- Inverter Disconnect Panel/s suitable rating of 4 Pole MCCB/s with AC SPD's with phase indication lamps, brass or SS Double compression Glands for Armoured cables and PVC Glands for Flexible copper cable. Separate Inverter Disconnect panels should be provided for each inverter supplied.
- 4 core copper cables to be provided from Inverter to Inverter disconnect Panels. All output cables from Inverter disconnect panels to Solar LT Panel should be XLPE Aluminium Armoured cables.
- Necessary capacity of Battery Stack (Lead Acid/ VRLA/ Lithium Ion with battery disconnect fuses and Battery cables of adequate capacity should be provided. The Battery should be deep discharge type with a minimum warranty of 5 years and from a reputed manufacturer.
- Battery room enclosure to house the necessary battery and the equipments should be provided. The room /Enclosure should be well ventilated to prevent battery and equipment to be overheated. Suitable provision for the same should be made by the bidder.
- Solar L.T Panel with Phase Indication Lamps, Required capacity MCCB's for incoming and outgoing cables. Digital Panel Meter of 0.5 class accuracy with PF, Voltage, Current, kWh, kW should be provided.
- Remote Monitoring System with Communication cable.
- ESE Lighting Arrestor and Protection system, earthing kits and earthing systems.
- PVC Pipe, trenches, Cement Pipes and accessories as required by design.
- Water piping along with module cleaning equipment including hose pipes and water outlets at convenient locations for regular cleaning of the Solar PV Plant. The client will provide water at a single point on the ground floor of the building.
- Fire extinguishers, danger plates, name board etc to be provided as per Electrical Standards.
- Transportation, loading, unloading of all materials, equipment's etc.
- Training of BAIF nominated executives and technicians.

- Testing equipments/material for maintenance, monitoring and regular upkeep of the Solar PV Power Generating system.
- Fuses and other protection devices.

Temperature controlled room to store batteries and other equipment is in BAIF Scope (The existing buildings or prefabricated room will be provided for the same.)

**Part C**

**Project Objective**

There are 2 Nos of 7.5 HP submersible pumps situated on the other side of road from main campus. One pump is already installed and presently operated on a separate HT line provided by Discom. The other 7.5 hp pump is to be installed which will be installed by BAIF team on the basis of recommendation given by the vendor. The structure is to be installed on the existing polyhouse structure and the necessary strengthening of the existing Polyhouse structure should also be carried out by the bidder.

Suitable ladders to access the Solar Modules for maintenance should be provided. FRP walkway and SS lifeline should also be provided.

The Module layout with walkway and access to roof should be provided to the client before commencement of work.

**System Requirements:**

For 7.5 HP Solar Pumping System:

The Solar Modules are expected to be mounted on the polyhouse on the other side of the campus from the location of the one borewell is 100 m away and other is 160 m away. The Pumps will be in the borewell and the Pump Controllers/VFD's are expected to be installed near the polyhouse.

- 2 Nos of 7.5 HP Submersible AC Pumps
- Minimum 20 kWp Solar PV System per Pump, one mounted on a existing polyhouse with required strengthening of structure.
- Pump Controllers/ VFD
- Complete System with DC cabling/AC Cabling, SPD's and other Protection devices

- Remote Monitoring system to record the discharge per day in litres, Solar Energy Generation in kWh. The data should be available on a daily, monthly and annual basis.

SECTION 3: OTHER REQUIREMENTS:

1. Installation work shall be performed with respect to the following but not limited to:

    - Clamping and securing the Solar Modules on the Module Mounting Structures with necessary SS fasteners
    - Installation of Pump Controllers/ VFD's , String Inverters, Switchgears, DC Distribution Boxes , AC Distribution Panels/ Inverter Interaction Panels, Solar LT Panel, Solar Metering Panel and other accessories as per requirements, etc.
    - Installation and laying of DC cable from string ends to the Pump Controllers / DCDB's / inverter through flexible DWC pipes. All underground pipes should be laid below the 3.5 feet to allow agricultural operations. All ends of the pipes should be sealed with Silicone gel to prevent rodents or insects from damaging the DC cables. DC +ve wires and DC -ve wires should be routed through separate pipes. Tagging of strings at module end and inverter end is mandatory.
    - Installation and laying of underground AC cables (below 3.5 feet) through Conduit pipes / Hume Pipes/ Cement pipes. Cable Chambers with covers to be provided at each end for ease of drawing of cables.
    - Installation of ESE Lighting Arrestor.

2. Testing of all strings, DC inputs, Control Panels, AC & DC Terminations, Solar LT Panels, Communication systems, earth pits, etc and commissioning of the Standalone, Off grid and On Grid Solar PV Power Plants as per the requirements mentioned in Part A, B & C.

3. Submission of following documents, drawings, Datasheets, design and engineering information to Project-In-Charge of BAIF & Co Ltd. or its authorized representative for approval.

    - Datasheets of all equipments/components.
    - Datasheets for LA, Switchgears
    - Solar Module Layout drawing
    - String Layout and DC Wiring drawings
    - SLDs
    - O&M Manuals
    - IEC Certificates and Factory Test Reports for Pump Controller / Inverter.
    - IEC Certificates and Flash Test Reports for Solar Modules.

4. Clearing the site after installation work should be carried out by the selected bidder. The site during construction stage should also be regularly cleaned of any unwanted material/plastic packaging/boxes etc.

5.. The selected bidder shall furnish a schedule of inspection / testing of major equipment so that BAIF may send its representative to witness the tests. All equipment testing/inspection reports, factory test reports, site commissioning report should be furnished by the selected bidder upon completion of installation and commissioning of the project. However, this shall not absolve the responsibility of the bidder of providing the performance guarantee/ warrantee.

6. BAIF team and /or its authorized representative will carry out physical inspection of all the material delivered at site.

7. All equipment, components and material supplied should adhere to the latest version of international / national standards.

8. Any other item not specifically mentioned in the specification but which are required for installation, commissioning and satisfactory operation of the Solar Power plant are deemed to be included in the scope of the specification unless specifically excluded on turnkey basis.

**Expected Solar PV Plant Design Requirement**

The proposed-on grid Solar PV System should be connected to the Discom Grid as per the State policy.

The Off Grid/ Hybrid/ AC Coupled and Standalone Systems should provide reliable power to productive loads, households, and street lights. The system should be designed in such way that, the load requiring storage will be powered through an inverter with back up and motors loads without backup requirement will be powered through Solar VFD.

The inverter and other motor loads should be connected to the centralized PV arrays though an intelligent load controller, which will ensure 100 % utilization of Solar array. The system should have IoT enabled remote monitoring and control system for performance and impact monitoring.

- The system must be designed for maximum safety and durability considering the long life of the solar modules.
- The Solar Modules will be mounted as per the proposed designs and the proposed structures.
- The selected bidder will also have to inspect and suitably decide the point of evacuation of energy generated from the Solar PV Plant.

The basic and detailed engineering of the Solar PV Plant shall aim at achieving high standards of operational performance especially considering the following:

- ⇒ Optimum availability of Solar Modules during the daytime
- ⇒ Ensure proper layout of Solar Modules and structure to prevent shading of Modules.
- ⇒ Selecting the best Off/hybrid / Hybrid Inverter with high track record, having excellent after sales support in India and ready availability of spare inverters for quick replacement.
- ⇒ Careful logging of operation data / historical information from Data monitoring systems and sending alerts / notifications etc for quick rectification of faults.
- ⇒ Based on the Solar Insolation data, the Solar PV Power System should be so designed that it shall take into the peak and lowest temperatures and suitably select the cable so that all AC side line losses are below 3%.
- ⇒ The installation practices should be as per industry standards maintaining all safety standards.
- ⇒ Excellent workmanship is expected and aesthetic look and qualitative performance should be as per international / national standards only.

**Expected Solar PV Plant Design Requirement**

**1. Technical Specification of Solar Plant for PART A**

A. SOLAR PHOTOVOLTAIC MODULES

- The PART A is divided in to three sub parts in as PART A1, PART A2, PART A3 each of 30 kWp capacity.
- The solar photovoltaic modules to be used for the for PART A1 of the project should be of Bifacial Mono Crystalline TopCon technology and capacity of greater than or equal to 580Wp
- The solar photovoltaic modules to be used for the PART A2 and for PART A3 of the project should be Mono Crystalline PERC Technology and capacity of greater than or equal to 545Wp
- The solar modules shall have suitable encapsulation and sealing arrangements to protect the Silicon cells from the environment. Solar Modules should be supplied from reputed manufacturers with fully automatic production line only.
- Module should be PID Free and of positive Tolerance only.
- Modules should have an efficiency of not less than 20% and the fill factor should be equal to or above 75%.
- SPV modules should be designed and manufactured to meet the recognised standard, which must

have been used extensively with an excellent track record of performance. Higher efficiency Solar PV Modules shall be preferred. Bidders should submit the technical literature with detailed technical and manuals.

- Solar Module manufacturer should be listed in the Approved List of Module manufacturers (ALMM) as per the latest list uploaded on the Ministry of New and Renewable Energy's website.
- The SPV Module should be tested and should have IEC test certificate from any recognized IEC accredited test centres. The Test certificates can be from any NABL/ BIS accredited Testing / calibration laboratories. The test certificates should have validity of at least 6 months from the date of submission of the tender document.
- The SPV modules should conform to the minimum technical specification laid down by MNRE.
- SPV Modules shall be certified as per IEC 61215, IEC 61730 and IEC 61701 amended up to date or equivalent standards.
- The PV Modules shall be tested for Salt Mist Corrosion Test as per MNRE requirement.
- The Solar Modules offered shall have a Power warranty of 27 years. Solar PV modules must be warranted for their output peak watt capacity, which should not be less than 90% of the name plate rated capacity at the end of 12 years and not less than 80% of the rated name plate capacity at the end of 27 years. All specifications refer to the Standard Test Conditions (STC).
- The flash test certificate for each PV Module with Serial Numbers must be submitted along with the Handover documents.
- The Solar PV Modules should also be warrantied against manufacturing defects and workmanship for 12 years.

**2. Technical Specification of Solar Plant for PART B**

A. SOLAR PHOTOVOLTAIC MODULES

- The solar photovoltaic modules to be used for the PART B of the project should be of Mono Crystalline PERC technology and capacity of greater than or equal to 545Wp
- The solar modules shall have suitable encapsulation and sealing arrangements to protect the Silicon cells from the environment. Solar Modules should be supplied from reputed manufacturers with fully automatic production line only.
- Module should be PID Free and of positive Tolerance only.
- Modules should have an efficiency of not less than 20% and the fill factor should be equal to or above

75%.

- SPV modules should be designed and manufactured to meet the recognised standard, which must have been used extensively with an excellent track record of performance. Higher efficiency Solar PV Modules shall be preferred. Bidders should submit the technical literature with detailed technical and manuals.
- Solar Module manufacturer should be listed in the Approved List of Module manufacturers (ALMM) as per the latest list uploaded on the Ministry of New and Renewable Energy's website.
- The SPV Module should be tested and should have IEC test certificate from any recognized IEC accredited test centres. The Test certificates can be from any NABL/ BIS accredited Testing / calibration laboratories. The test certificates should have validity of at least 6 months from the date of submission of the tender document.
- The SPV modules should conform to the minimum technical specification laid down by MNRE.
- SPV Modules shall be certified as per IEC 61215, IEC 61730 and IEC 61701 amended up to date or equivalent standards.
- The PV Modules shall be tested for Salt Mist Corrosion Test as per MNRE requirement.
- The Solar Modules offered shall have a Power warranty of 27 years. Solar PV modules must be warranted for their output peak watt capacity, which should not be less than 90% of the name plate rated capacity at the end of 12 years and not less than 80% of the rated name plate capacity at the end of 27 years. All specifications refer to the Standard Test Conditions (STC).
- The flash test certificate for each PV Module with Serial Numbers must be submitted along with the Handover documents.
- The Solar PV Modules should also be warrantied against manufacturing defects and workmanship for 12 years.

**3. Technical Specification of Solar Plant for PART C**

A. SOLAR PHOTOVOLTAIC MODULES

- The solar photovoltaic modules to be used for the PART C of the project should be of Mono Crystalline PERC technology and capacity of greater than or equal to 545Wp
- The solar modules shall have suitable encapsulation and sealing arrangements to protect the Silicon cells from the environment. Solar Modules should be supplied from reputed manufacturers with fully

automatic production line only.

- Module should be PID Free and of positive Tolerance only.
- Modules should have an efficiency of not less than 20% and the fill factor should be equal to or above 75%.
- SPV modules should be designed and manufactured to meet the recognised standard, which must have been used extensively with an excellent track record of performance. Higher efficiency Solar PV Modules shall be preferred. Bidders should submit the technical literature with detailed technical and manuals.
- Solar Module manufacturer should be listed in the Approved List of Module manufacturers (ALMM) as per the latest list uploaded on the Ministry of New and Renewable Energy's website.
- The SPV Module should be tested and should have IEC test certificate from any recognized IEC accredited test centres. The Test certificates can be from any NABL/ BIS accredited Testing / calibration laboratories. The test certificates should have validity of at least 6 months from the date of submission of the tender document.
- The SPV modules should conform to the minimum technical specification laid down by MNRE.
- SPV Modules shall be certified as per IEC 61215, IEC 61730 and IEC 61701 amended up to date or equivalent standards.
- The PV Modules shall be tested for Salt Mist Corrosion Test as per MNRE requirement.
- The Solar Modules offered shall have a Power warranty of 27 years. Solar PV modules must be warranted for their output peak watt capacity, which should not be less than 90% of the name plate rated capacity at the end of 12 years and not less than 80% of the rated name plate capacity at the end of 27 years. All specifications refer to the Standard Test Conditions (STC).
- The flash test certificate for each PV Module with Serial Numbers must be submitted along with the Handover documents.
- The Solar PV Modules should also be warrantied against manufacturing defects and workmanship for 12 years.

B. TECHNICAL SPECIFICATION FOR ON GRID INVERTER (PART A) , OFF GRID INVERTERS/ HYBRID (PUMP CONTROLLERS (PART B) AND (PART C)

HYBRID / OFF GRID INVERTERS

The Inverter used should be robust, intelligent Off/grid/ Hybrid string inverters manufactured by reputed international companies having sales and service office in India. The Inverter can be 3 Nos of single phase inverters combined to form a 3 phase network.

- Input Voltage – 48V-700V DC
- Output Voltage – 415-430V AC
- Battery Charger- MPPT Charge Controller or AC Charging (AC Coupled Operation) or single hybrid inverter.
- Protection: AC Short Circuit/ AC Overload, DC reverse Polarity Protection, Battery Fuse, Over temperature/ battery deep discharge protection
- Conversion Efficiency > 96%
- Remote Monitoring
- Warranty: 5 years
- Solar battery charging power should be equal solar capacity

PART B: PUMP CONTROLLER

- Input Voltage – 200V -800V DC (wider range is preferred)
- Output Voltage – 360V -460V AC
- Frequency -0 to 400 Hz
- IP65 Protection
- Remote Monitoring
- Warranty: 5 years

PART C: ON GRID INVERTER

The inverter/s must conform to the IEC 61683 and IEC 60068-2, IEC 62116, IEC 61727. The typical specifications required are as under:

- The inverters should be string inverters only with IP65 or IP67 rating for outdoor applications with rated AC Output capacity of maximum 50 kW.
    - All inverters should be 3 phase, 415V, 50Hz AC output
    - Maximum Input Voltage: 1000V DC
    - Euro / CEC Efficiency above 97%
    - Frequency: 50Hz +/- 1.5%
    - Power Factor > 0.99
    - THD < 3%
    - Ambient Temperature range: $-20^0$ C to + $55^0$ C
    - Warranty: 5 Years Comprehensive extendable upto 20 years
    - Integrated Ground Fault Protection

- In built DC Surge protection or external in DCDB.
- Anti Islanding Feature
- Without Transformer
- Over Voltage/ Under Voltage Protection
- Auto Shut down in case or Over Heat/Over Temperature.

The Solar On-Grid Inverters should be provided with necessary hardware and software for remote monitoring of the Solar PV System. Key features but not limited to

- 230V/400V Three-phase Pure sine wave inverter.
- Self-consumption and feed-in to the grid.
- Auto restart while AC is recovering.
- Programmable supply priority for battery or grid.
- Programmable multiple operation modes: On-grid, off-grid and UPS.
- Configurable battery charging current/voltage based on applications by LCD setting.
- Configurable AC/Solar/Generator Charger priority by LCD setting.
- Compatible with mains voltage or generator power.
- Overload/over temperature/short circuit protection.
- Smart battery charger design for optimized battery performance
- With the limit function, excess power overflow to the grid is prevented.
- Supporting WiFi monitoring and build-in MPPT tracker,
- The smart settable has three MPPT charging stages for optimized battery performance.
- Time of use function.
- Smart Load Function

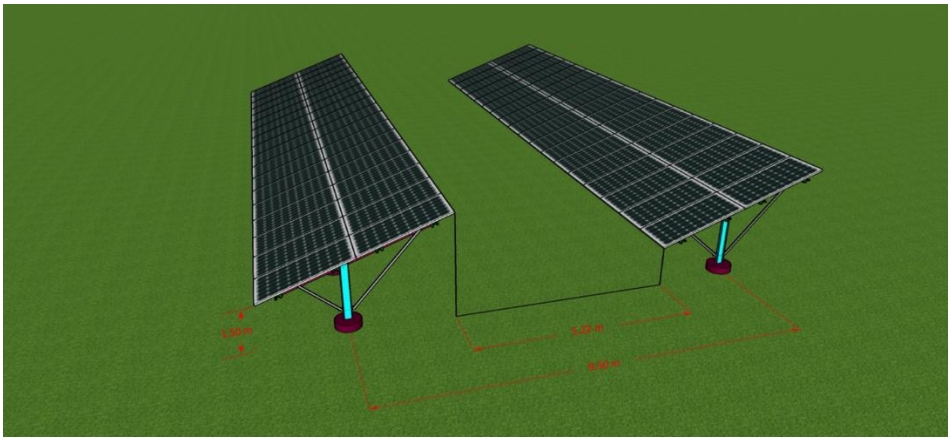
**Approved Make of the Inverter are: Luminous, SMA, Sungrow, Solis, Growatt, Deye or any other equivalent make having latest IEC certification. Acceptance of other equivalent make will be the discretion of BAIF.**

## D. TECHNICAL SPECIFICATION FOR SOLAR MODULE MOUNTING STRUCTURE

**PART A:**

The MMS required for Part A system which is a 90 kWp Solar PV System is a Ground Mounted MMS with following models

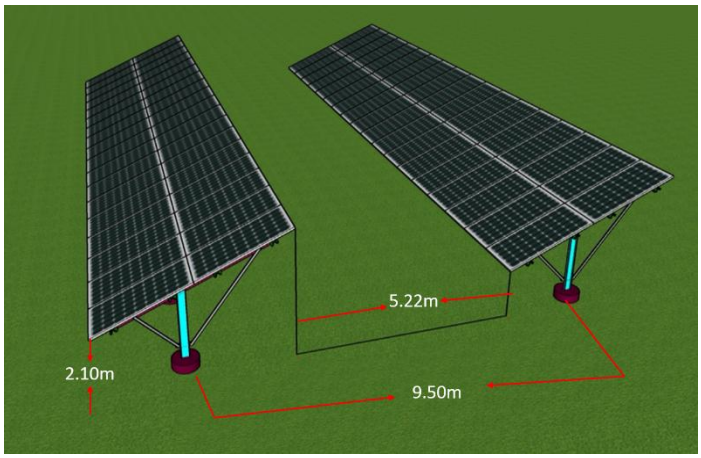
**PART A1:** 30 kWp with 9.5 m pitch and with the lowest end of the module should be at a height of 1.5 m from the Ground level as indicated in the drawing below.



Ground Mounted Standard MMS with Hot Dip Galvanized Columns, Rafters, Bracing, Hat Shaped Galvalume Purlin, SS 304 Fasteners for Structure and Module mounting. The design should be capable of withstanding wind speed of 160 kmph. The foundations should be of M25 concrete. The piling depth and the entire structural design should be certified by a Structural Engineer.

The steel structures shall be fabricated of structural steel as per latest BIS 2062 (amended up to date) galvanized in compliance of BIS 4759 (amended up to date). The lowest end of the module should be at a height of **1.5 m from the Ground level** and the tilt angle of the modules should be 10° from the ground horizontal. The minimum expected weight of the MMS Structure is 25 Tonnes/ MWp of installation i.e. For 30kWp installation ~ 750 kg's.

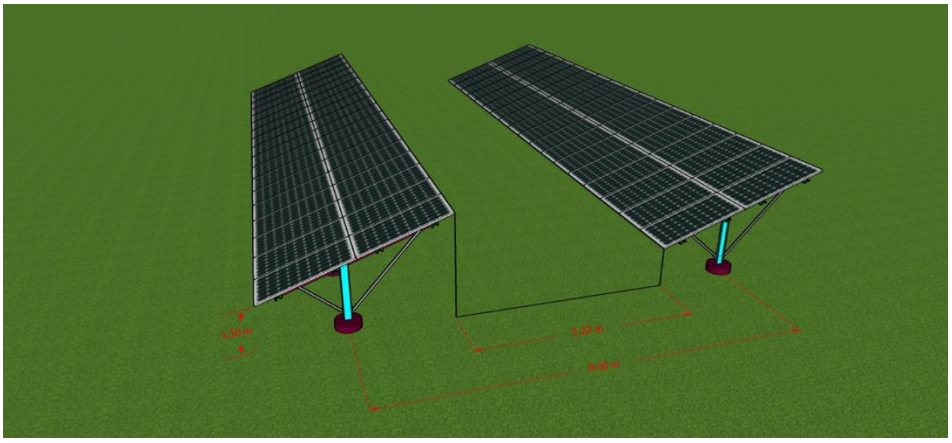
**PART A2:** 30 kWp with 9.5 m pitch and with the lowest end of the module should be at a height of **2.10 m from the Ground level** as per following drawings




Ground Mounted Standard MMS with Hot Dip Galvanized Columns, Rafters, Bracing, Hat Shaped Galvalume Purlin, SS 304 Fasteners for Structure and Module mounting. The design should be capable of withstanding wind speed of 160 kmph. The foundations should be of M25 concrete. The piling depth and the entire structural design should be certified by a Structural Engineer.

The steel structures shall be fabricated of structural steel as per latest BIS 2062 (amended up to date) galvanized in compliance of BIS 4759 (amended up to date). The lowest end of the module should be at a height of **2.10 m from the Ground level** and the tilt angle of the modules should be 10° from the ground horizontal. The minimum expected weight of the MMS Structure is 30 Tonnes/ MWp of installation i.e. For 30kWp installation ~ 900 kg's.

**PART A3:** For 30 kWp with 9.5 m pitch and with the lowest end of the module should be at a height of 1.5 m from the Ground level as per following drawings



Ground Mounted Standard MMS with Hot Dip Galvanized Columns, Rafters, Bracing, Hat Shaped Galvalume Purlin, SS 304 Fasteners for Structure and Module mounting. The design should be

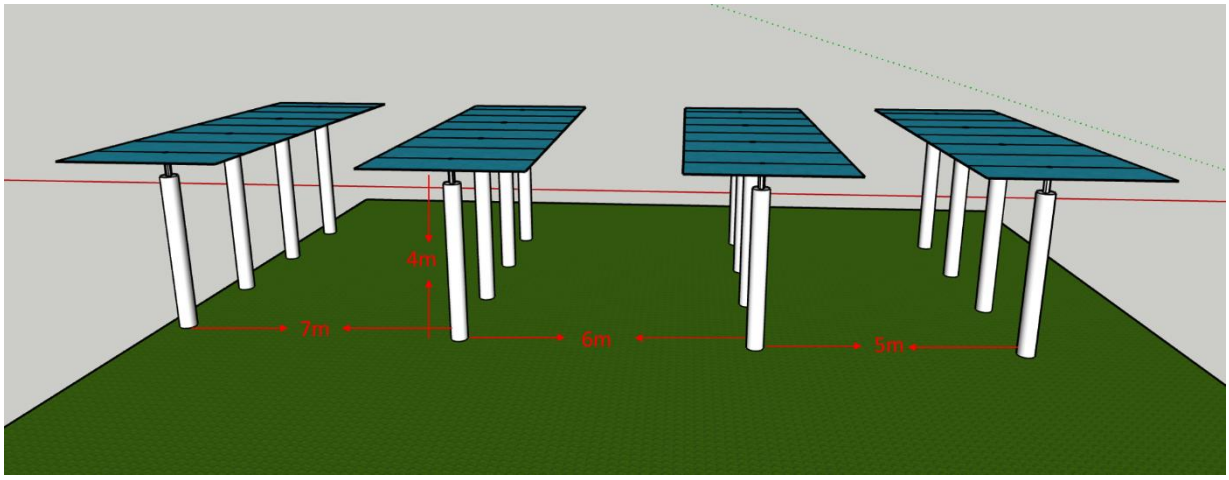
capable of withstanding wind speed of 160 kmph. The foundations should be of M25 concrete. The piling depth and the entire structural design should be certified by a Structural Engineer.

The steel structures shall be fabricated of structural steel as per latest BIS 2062 (amended up to date) galvanized in compliance of BIS 4759 (amended up to date). The lowest end of the module should be at a height of 1.5 m from the Ground level and the tilt angle of the modules should be 10° from the ground horizontal. The minimum expected weight of the MMS Structure is 25 Tonnes/ MWp of installation i.e. For 30kWp installation ~ 750 Tonnes.

**PART B1:** For 50 kWp Solar PV System the MMS required is a Ground Mounted MMS having 5 row of MMS with Solar Modules in 1C x 1 R grid . The minimum pitch between R1- R2 should be 11.5 m, R2-R3 should be 10.5 m pitch, R3 - R4 should be 9.5 m and R4 - R5 should be 8.5 m. All rows are to be designed with Hot Dip Galvanized Columns, Rafters, Bracing, Hat Shaped Galvalume Purlin, SS 304 Fasteners for Structure and Module mounting. The design should be capable of withstanding wind speed of 160 kmph. The foundations should be of M25 concrete. The piling depth and the entire structural design should be certified by a Structural Engineer.

The steel structures shall be fabricated of structural steel as per latest BIS 2062 (amended up to date) galvanized in compliance of BIS 4759 (amended up to date). The lowest end of the module should be at a height of 1.5 m from the Ground level and the tilt angle of the modules should be 10° from the ground horizontal. The minimum expected weight of the MMS Structure is 25 Tonnes/ MWp of installation i.e. For 50kWp installation ~ 1.25 -1.30 Tonnes.

**PART B2:** In this the 40 kWp installation of Solar PV System has to be with Mono Crystalline PERC Technology and capacity of greater than or equal to 545Wp, mounted on Reinforced Concrete Columns (RCC)and the lightweight Galvalume (coating consisting of zinc, aluminium and silicon that is used to protect steel from oxidation) structures at a height of 4 metres. The panels are fixed at a tilt angle of 10°, with Solar Modules distributed over 4 rows and spacing of 7 metres in 1st and 2nd, 6 metres in 2nd and 3rd, 5 metres in 3rd and 4th with inter-column spacing of five metres, facilitating the movement of tractors and different sized farming equipment's.



PART C: The solar structures required to be mounted on the existing Polyhouse the required strengthening is to done by the vendor. The installation should be as per the angle of the roof of the polyhouse. The inter-row and inter-column spacing should be five metres. The panels are arranged in a zigzag pattern, ensuring sunlight penetration to every part of the land beneath.

Suitable access ladder to be created for Cleaning and Maintenance of the Solar PV Plant. FRP walkway and Lifelines should be provided for safety of the cleaning staff.

E. TECHNICAL SPECIFICATION - CABLES & ELECTRICAL CONTROLS

- All the necessary Solar DC cables / wires supplied, shall be of stranded Copper conductor only according to IEC 60228, with XLPO insulation, UV resistant and resistant against water, oil & salt, Halogen free, Low smoke emission, and flame-retardant features. Positive and Negative Solar DC cables and wires have be routed through suitable separate flexible PVC pipes/ Cable trays etc. Solar DC cable / wire maximum temperature rating should be +120 $^{0}$ C. The solar DC cables should carry out a TUV certification.
- AC cables from Inverter-to-Inverter Interactive Panel should be 1.1kV grade, 4C stranded copper conductor, of suitable rating as per requirement.
- 4/ 3.5 core XLPE Copper / Aluminium Armoured cable of suitable thickness is to be used from Inverter Interaction Panel to the Main L.T Panel conforming to IS:1554/IEC :227.
- All connections should be properly made through suitable lug/terminal crimped with use of suitable proper cable glands.
- The size of cables/wires should be designed considering the line loses, maximum load on line, keeping voltage drop within permissible limit and other related factors. Maximum permissible line losses should be less than 3%.
- The cables and wires should be ISI marked and conform to latest BIS standards as required by MNRE for Solar applications. The ambient temperature range of the cables and wires to be used should be from -5$^{0}$ C to + 90$^{0}$ C and above only.
- All flexible AC cables to be properly dressed in G.I Cable trays with covers.
- Suitable ferrules for DC cables are to be used to number the cables for easy traceability.
- The AC cables are to be terminated in the equipment with suitable lugs that are properly crimped.
- Flexible pipes and conduits are to be suitably used at corners and at places where there is a possibility

of the cables getting cut by abrasion.

- All cables shall be of low smoke FRLS type and shall be routed through sand filled trenches between Inverters upto the Main LT Panel and existing LT Panels.

**Solar DC Cables approved Make: LAPP, Siechem, Apar or any other equivalent reputed brand**

**AC cables: Finolex, Polycab, Havells, KEI, or any equivalent reputed brand.**

**Lugs: Dowell/ Bracko/Equivalent**

F. LIGHTNING, SURGE AND OVER VOLTAGE PROTECTION

- The SPV power plants shall be provided with ESE lightning protection system with 107m radius of coverage. The main aim 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, atmospheric disturbances, etc.
- Suitable equipments for AC and DC Surge Protection should be provided with the system.
- The area of the Solar PV Yard/ Array shall be suitable protected against lightning by deploying required number of Lightning Arrestors. Lightning arrestors should be as per IEC 62305.The protection against induced high-voltages shall be provided by use of metal oxide varistors (MOVs) and suitable earthing so that induced transients find an alternate route to earth.
- The lightning Masts/ Conductors shall be made as per applicable Indian Standards/International standards to ensure complete protection of the Solar PV Yard and equipments/components therein.
- Necessary support for securely holding the lightning conductor in position should be used taking into consideration the wind speed in the area. Necessary guy wires should be given to ensure that the lighting conductor remains in position in event of heavy winds.
- The Lightning Arrestors must be connected to 2 separate earth pits through suitable size copper cables/wire. The same should be confirm to necessary IS standards.
- A counter must be provided for every ESE Lightning Arrestor.
- All AC SPDs in the field will be of Type I + II.

G. EARTHING PROTECTION

- The earthing system shall be in strict accordance with IS: 3043 and electricity rules/Acts.
- The earthing system network / earth mat shall be of interconnected mesh of GI Flats buried

in the ground in the plant. Suitable size of GI Flats to be used for the interconnection. The earth conductors shall be free from pitting, laminations, rust, scale and other electrical mechanical defects.

- Metallic frames of all electrical equipment shall be earthed by 2 separate and distinct connections to the earthing system, each of 100% capacity.
- Metallic sheaths/ screens and armour of multicore cable shall be earthed at both ends.
- Neutral connections and metallic conduits / pipes shall not be used for equipment earthing.
- Connections between earth leads and equipment shall be normally of bolted type.
- Back filling material to be placed over buried conductors shall be free from stones and harmful mixtures. Back filling shall be placed in layers of 150mm.
- Minimum spacing between electrodes shall be 3000mm.
- Necessary test point provision shall be made for bolted isolated joints of each earthing pit for necessary periodic checking of earth resistance.
- In compliance to Rule 33 and 61 of Indian Electricity Rules, 1956 (as amended to date), all non-current carrying metal parts shall be earthed with two separate and distinct earth continuity conductors to an efficient earth electrode.
- The Solar structure, inverter, lighting arrester should have separate earth pits. The number of earth pits is to be decided by the Bidder as per the requirements of the electrical inspector or any concerned statutory body for the region.
- The earthing pit shall have to be made as per IS: 3043. All the array structures, equipments and control systems should be compulsorily connected to the earth. The earthing arrangement should also be approved by the electrical inspector.
- The approved drawings from electrical inspector must be submitted to BAIF on completion of the project.
- Total plant earthing system shall be designed to give an earth resistance of less than 1 ohm all along with earth mesh.

G. INVERTER DISCONNECT PANEL, SOLAR LT PANEL AND SOLAR GENERATION METERING PANEL

- These shall consist of M.S Power coated box with louvers for ventilation.
- The cable entry should have Brass or SS metallic double compression glands for armoured cables and PVC Glands for Flexible copper cables

- Incoming & Outgoing Switchgears- Suitable 4 pole MCCBs with phase barriers, rotary handle with door interlock and defeat, spreader links
- Protection –IP-54 for Outdoor mounting with Canopy.
- Mounting: Inverter Disconnect Panel: Wall Mounted and Solar LT Panel: Floor mounted with Stand.
- Material- CRCA sheet 14 gauge
- Paint- Power coated Siemens grey.
- Unidirectional meter for recording total generation of 0.5 class accuracy with necessary CT.

Approved Makes-

- Switchgear- Schnider/ABB /Siemens/ L&T

Panel Digital Meter: Secure/L&T equivalent

- AC SPD Type I+II : Phoenix/ L&T/ Citel/ Eaton

Insulated Bus Bar of suitable size to be provided.
LED Phase Indicators

**Note: The CTs and unidirectional Solar Generation meter in Solar Generation metering panel will be as per the specifications of BESCOM ( Only for the 24 kWp On Grid Solar PV Plant).**

I. REMOTE MONITORING SYSTEM:

The Remote Monitoring System should preferably be provided by the inverter/ Pump Controller company as the case may be. In case there are Off/hybrid Grid and AC Coupled System, where there may be two makes of inverters, third party hardware and software compatible with the supplied inverters can also be supplied. The function of the Remote Monitoring system is to monitor the daily, weekly, monthly and annual generation data of the Solar PV Plant using GPRS/ LTE or broadband network. The System should also record the errors and faults for early detection and resolution. The access to the data should be provided to the authorized representatives of (Name of client) only.

The Remote Monitoring system shall comprise of the following main components:

- The inverter / Pump Controller logs the data and transmits the same to the Data logger. Data Logger can be in-built or can be externally mounted.
- Data logger gathers information and monitors the performance of the Solar PV Plant.
- An internet router which supports 3G/4G/5G Sim card should be supplied in case the client cannot provide firewall free access for the Remote Monitoring system. The client would have to provide the SIM Card for the same.

Following Sensors to be provided (1 Set each for Part A, Part B & Part C):

- Ambient Temperature, Module Temperature, Anemometer, Irradiance.
- For Off Grid/ AC Coupled System, in addition to the above, Battery Temperature Sensors should be provided.

All the Sensors provided, should be compatible with the Remote Monitoring System provided.

J. SOLAR MODULE CLEANING FACILITY

- The bidder should provide for a system using water for periodic cleaning of Solar Modules.
- All necessary accessories for removing the soiled modules for dry and wet cleaning must be provided.
- All pipes and fittings should be of CPVC material with suitable PVC valves to adjust the water flow and pressure.
- The water for cleaning of the Solar Modules will be provided by the client for the AMC activities.
- A brush with a telescopic cleaning rod is to be provided.
- The client will provide water at one location near the Solar PV Plant. The water storage facility (using 2 Litre/module/cycle as benchmark) should be provided along with a pump and filter by the bidder.

K. OTHER FACILITIES FOR INSTALLATION

Net Meter and Solar Generation meter ( FOR PART C ONLY): The client is in the process of getting a new Connection of around 24kW for their common load. The main meter will be a ABT meter. The Main billing meter and the Solar Generation meter along with CT's etc will be provided by the bidder.

**M: BATTERY BANKS (PART B)**

- **Lead acid type/ VRLA / Lithium-Ion Batteries with deep discharge capabilities for Solar Applications**
- **Battery with Battery Stand, temperature sensors**
- **BMS with DOD, State of Charge indication**
- **Useable battery capacity -80KWh (80 units), for part B2 is 50kWh (50 unit) , battery should provide mentioned unit backup.**
- All batteries should carry a minimum warranty of 5 years from the date of commissioning.

**4. Warranties & Guarantees**

A. The selected bidder shall give full warranty that all the equipment/devices/instruments/systems/sub-systems/any materials supplied under the CONTRACT shall be new and of first quality according to the specifications and shall be free from defects (even concealed faults, materials & workmanship).

B. If there is any trouble or defect, originating from the design, material, workmanship, performance of any material/ equipment any time prior during DLF, the selected bidder shall, at his own expense and as promptly as possible, make such alterations, repairs and replacements as may be necessary to permit the materials to function in accordance with the specifications and to fulfil the foregoing guarantees.

C. Each solar PV module used in the solar power plant, shall be warranted by the manufacturer with free replacement if the output peak wattage capacity under standard test condition (STC), falls below 90% in first 12 (twelve) years and falls below 80% in 27 (twenty-seven) years, from the date of successful commissioning of SPV power plant. The Solar Modules shall also be warrantied against manufacturing defects for 10 years from the date of commissioning of the Solar PV plant. The warranty shall be transferred in the name of BAIF after commissioning of the Solar PV Plant.

D. String Inverters and data monitoring system shall be warrantied for 5 years provided by OEM. The warranty shall be transferred in the name of BAIF after commissioning of the Solar PV Plant. The Warranty of the Solar Inverter should be extendable up to 20 years by the OEM with payment of necessary additional warranty charges.

E. All other components, equipment is like Inverter Disconnect Panels, Solar LT Panel, AC & DC cables, connectors, Module Mounting Structure, foundations, metering cubicles etc. should be warrantied for one year from date of commissioning of the Solar PV Plant. The warranty from all OEM equipments shall be transferred in the name of BAIF after commissioning of the Solar PV Plant.

F. Standard warranty for all equipment to be supplied such as Pumps, Pump controllers, battery bank etc should be 5 years.

**5. Inspection & Testing**

i. Successful bidder to provide BAIF the Quality assurance plan (QAP) and drawings for approval before starting the installation work. Drawings shall include, SLD of Solar PV System, String design drawings, Earth pit Drawing, Solar PV Plant Layout drawing showing all components/equipment locations, Solar Module Mounting Structure GA drawing, Foundation drawing for mounting structure, Solar LT Panel GA drawing with metering arrangement, other foundation drawings, LA location drawing with protection radius clearly shown as per the requirements of the Electrical Inspector.

ii. Tests certificate from the manufacturer for all the major equipments such as Solar modules, inverters, DC Cables. AC Cables, battery etc. shall be submitted while handing over the documents

**6. Document submission at various Stages**

**1. Documents to be submitted for Technical Evaluation**

a. Datasheets of Solar Modules (Only 1 make to be selected)

b. Datasheets of Solar String Inverters / Pumps/ Pump Controllers/ Battery bank (Only 1 make to be selected)

c. Proposed SLD

d. Proposed Solar Module Layout

e. LA Coverage area drawing.

f. PV SYST report for the site with expected annual generation in kWh.

Documentary evidence for establishing work experience and financial capabilities as per tender requirement

Check list for Compliance and Deviation

**2. Documents to be submitted by Selected Bidder for Notice to Commence (NOC) work from BAIF (Submission within 10 days from date of LOI or PO whichever is earlier)**

a. Activity Bar chart

b. Solar PV Plant Layout Drawing indicating locations Inverters, Inverter Disconnect Panel, LA, Earthpits, Solar LT panel, etc.

c. LA Coverage drawing

d. Single Line Diagram for Solar PV Power Generating System

e. Earthing System drawing

f. Any other drawings required by BAIF.

**3. Handing Over documents (Within 7 days from Successful Commissioning of the Solar PV Plant)**

a. In-built drawings

b. Operation manuals

c. Maintenance manual

Three sets of installation manual / user / operation and maintenance manual shall be supplied. The manual shall include complete system details such as array layout, schematic of system, inverter details, technical catalogue of all major components of the system, warranty certificates, working principle etc. Step by step

maintenance and troubleshooting procedure shall be given in the manuals. The following minimum details must be provided in the Manual:

- About Solar Photovoltaic Module, String Inverter.
- Clear instructions about mounting and maintaining of Solar PV module and string inverter and other equipments
- DO's and DONT's,
- Clear instructions on regular maintenance and Trouble Shooting of the power plants.
- Name and Address of the person or Centre to be contacted in case of failure or complaint.
- Approved Layout and Electrical Single Line diagram by Electrical Inspectors office.
- Meter, CT testing fee receipts or any receipts for fee payment done to Government departments by selected bidder.
- DISCOM sanction letter for Net metering of Solar PV Power Plant.
- Net metering Agreement between DISCOM and BAIF.
- Factory Test Certificates and IEC Certificates for Solar Inverters and other OEM items.
- Flash Test report of Individual Solar Modules.
- ACDB, Solar LT Panel factory test certificate
- ESE LA factory test report
- Earth resistance report for individual earth pits.
- Solar PV Plant Installation Report
- Solar PV Plant commissioning report

**7. Generic:**

**Site Visit**: The tenderer has to visit and examine the delivery site/client office and obtain all the information that may be necessary for preparing the Bid. The costs of visiting the site shall be borne by the tenderer. The successful tenderer has to supply all essential accessories required for the successful installation and commissioning of the goods/services supplied.

**8. Special Terms & Conditions**

**A. Completion Period**

The time schedule for total work according to the contract shall be maximum three months from the date of placement of order and the last date for completion of the installation of the project is 25th March 2025.

**B. Service Timelines**

Timely servicing / rectification of defects during warranty period and CMC period: After having been notified of the defects / service requirement during warranty period, the seller has to complete the required service / rectification as per the instruction/requirement of the owner.

**C. Pre-Dispatch Inspections (goods)**

Before shipment, vendor should completely test the system in its factory.

**Materials**: To be checked by the Vendor

**Construction and Mounting**: To be checked by the Vendor

**D. Preventive Maintenance visit**

Vendor must conduct the pre -visit to ascertain preventive maintenance requirement.

**E. Availability of spares**

The bidder shall ensure that necessary spares are always available with their service centres in Mumbai/Navi Mumbai/Pune to provide necessary after-sales service to BAIF during the performance guarantee period and AMC period. Documentary evidence or declaration letter for the details of service centres situated within 200 km distance from the plant site should be enclosed with the offer.

**F. Installation, Commissioning and Training**

The installation, testing and commissioning of the equipment shall be carried out by competent engineers/technicians of the Tenderer at the work site. During installation / commissioning, the Tenderer's engineer / technician shall impart necessary training to the Owner's personnel in driving and servicing the equipment to the level of clear understanding / adoptions. No separate charges will be paid by the Owner for these aspects.

**G. Quantity Variation**

The quantity as mentioned in the Schedule of Work/ Price Bid is indicative. The selected bidder/Vendor shall however ascertain the exact quantity required at site, obtain approval from the owner on quantity, supply and install accordingly. As the work progresses, it is possible that there will be quantity variations to any extent and omission of items especially, the quantity of cables and steel structure may vary extensively based on detailed design requirement/site conditions. Under such circumstances, the rates should be fixed

**H. Testing & Inspection**

All materials required for the execution of the work should be new and should conform to applicable standard specification and approved by the Engineer-in-Charge before actual use. Commencement of work without prior approval shall be entirely at the risk and cost of the Vendor. No delay due to non-availability of the materials, tools, equipment etc. will be entertained by the Owner. In the case of certain Machinery/ Equipment, the Engineer-in-Charge may inspect the item for approval, before they are brought to the site.
The Owner shall be entitled at all times at the risk of the Vendor to inspect and/or test by themselves or through any independent person(s) or agency (agencies) appointed by the owner and/or to direct the vendor to inspect and/or test all material(s), items and components whatsoever supplied or proposed for supply, for incorporation in the work inclusive, during the course of manufacture or fabrication by the Vendor and/or at the Vendors work or otherwise, such materials or items or components. The inspection and/or test shall be conducted at the expense of the Vendor and if conducted by the Vendor, may be directed by the Owner to be conducted by agency (ies) nominated by Owner and/or in the presence of witness (ess) nominated by the Owner.

The Vendor shall furnish specifications, contract documents and adequate samples of material intended for incorporation in the works to the Engineer-in-Charge for approval as and when required. Such samples are to be submitted before the work commences, permitting sufficient time for tests, examination(s) thereto by the Engineer-in-Charge. All materials furnished and incorporated in the work shall conform to the sample(s) in all respects.

The Engineer-in-Charge shall be entitled to reject at any point of time, any defective materials, item or components, (including special manufactured or fabricated items or components) supplied by the Vendor for incorporation in the works.
The Vendor shall at all times ensure highest standard of workmanship, relating to the work to the satisfaction of the Engineer-in-Charge. The Engineer-in-Charge shall have the power to inspect the work as also to test or instruct the vendor to test the works or any structure, material or component thereto at the risk and cost of the Vendor, either by the Vendor or by any agency(ies) nominated by the Engineer-in-Charge or Site Engineer on his behalf.
The Vendor shall provide all facilities, instruments material / labour and accommodation required for testing the works (including checking the set time out of work) and shall provide Engineer-in-Charge all assistance necessary to conduct the test whenever and wherever required.
If the Engineer-in-Charge on inspection or test is not satisfied with the quality or workmanship of any work, structure, material, component (decision of the Engineer-in-Charge being final in this behalf), the Vendor shall re-perform, replace, re-install and / or re-erect as the case may be such work, structure material or component, as no such rejected work, structure, material, item or component shall be used again without the prior permission of the Engineer-in-Charge.
Notwithstanding any condition provided in the foregoing clauses hereto and notwithstanding the fact that the Engineer-in-Charge/ or his representative has inspected tested and/or approved any particular work, structure, material or component, such inspection, test or approval shall not absolve the Vendor of his full responsibilities under the contract inclusive or relative to the specification and performance guarantee. The said inspection and test procedure being intended basically for satisfaction of the Owner / prima-facie erection and/or material and equipment supplied for incorporation in the work is in order.

On no account shall the Vendor proceed with the covering up or otherwise placing beyond reach of inspection or measurement any work before necessary inspection, entries are filled in the Site Inspection Register by the Engineer-in-Charge or his authorised representative. Should the vendor do so, the same shall be uncovered at the risk and expense of the vendor for carrying out the inspection and measurement. Measurement of Work shall be recorded as per the direction of Engineer-in-Charge.

If any tests are required to be carried out in connection with the work or materials or workmanship is not supplied by the Vendor, such tests shall be carried out by the Vendor as per the instructions of the Engineer-in-Charge and cost of such tests shall be reimbursed by the Owner.

The owner reserves the right to inspect the Equipment at Tenderer's works by them or through a third party nominated by the Owner. Tenderer will provide all assistance to the Inspector deputed by the owner for carrying out inspection at Tenderer's work free of charge.

**I. Site Particulars**

The intending tenderers shall be deemed to have visited the site and familiarised themselves thoroughly with the site conditions before submitting the tender. Non-familiarity with the site conditions will not be considered reason either for extra claims or for not carrying out the work in strict conformity with the drawings and specifications.

**J. Supply Of Material**

i. All materials required for the work shall be supplied by the Vendor. In addition, all materials required for temporary and enabling work shall be arranged and provided by the Vendor. All incidental expenses, loading, unloading, transportation, handling etc. shall be the responsibility of the Vendor and cost towards such expenses should be included in the finished item rates.

**ii.** All other materials, as required to complete the works in all respects according to the contract rates shall be inclusive of all freights, taxes, duties, loading, unloading, transporting, handling and storage charges etc. GST shall be payable separately as per applicable rate.

**9. Time for Completion of Work**

The tenderer shall submit the plan to complete the work within the stipulated time allowed for the execution of work as given in the Tender Documents and NIT.

a. The Vendor shall complete the work in all respects in accordance with the Contract and ensure that the entire work at each job site is completed within the time specified in the Time Schedule.

b. If the Owner so desires, the Progress Schedule in the form of CPM, giving the latest date of starting and latest date of finishing of various operations and the activities in the critical path and latest date for achievement of specific work so as to complete them in all respects (including testing and consequential operations) within the time provided in the Time

Schedule, has to be presented. This Progress Schedule should also indicate the interlinking of the various activities and bring to light the specific/critical items on which the inputs from the owner/ Engineer-in-Charge/Consultant or other agencies, if any, would be required, to ensure adherence to the schedule.

c. If the Vendor shall fail to submit to the Owner/ EIC a Progress Schedule as envisaged above or if the Owner/EIC and Vendor fail to agree upon the Progress Schedule as envisaged above, then the Engineer-in-Charge shall prepare the Progress Schedule (the dates of progress as fixed by the Engineer-in-Charge being final and binding upon the Vendor except as herein otherwise expressed provided), and shall issue the Progress Schedule so prepared to the Vendor, which shall then be the Approved Progress Schedule and all the provisions of clauses b. shall apply thereto.

d. Any reference in the Contract Documents to the Approved Progress Schedule" or to the "Progress Schedule" shall mean the "Approved Progress Schedule" specified in clause b. above or the "Progress Schedule" prepared and issued by the Engineer-in-Charge as specified in clause c. above, whichever shall be in existence. In the absence of such approved Progress Schedule or Progress Schedule prepared by the Engineer-in-Charge, the Progress Schedule first prepared by the Vendor (with incorporation of the Owner's / Engineer-in-Charge's comments thereon if any), shall until such approved Progress Schedule or such Progress Schedule prepared by the Engineer-in-Charge comes into existence, be deemed to be the Progress Schedule for the purpose of the contract.

e. Within 7 (seven) days of the occurrence of any act, event or omission which, in the opinion of the Vendor, is likely to lead to a delay in the commencement or completion of any particular work(s or operation(s) or the entire work at any job site (s) and as such would entitle the Vendor to an extension of the time specified in the Progress Schedule(s), the Vendor shall inform the Site Engineer and the Engineer-in-Charge in writing - the occurrence of the act, event or omission and the date of commencement of such occurrence. Thereafter, if even on the cessation of such an act or event or the fulfilment of the omission, the Vendor feels that an extension of the time specified in the Progress Schedule relative to the particular operation(s) or item(s) or work or the entire work at the job site(s) is necessary, the Vendor shall within 7 (seven) days after the cessation or fulfilment as aforesaid make a written request to the Engineer-in-Charge for extension of the relative time specified in the Progress

Schedule and the Engineer-in-Charge may at any time prior to the completion of the work extend the relative time of completion in the Progress Schedule for such period(s) as he considers necessary, if he is of the opinion that such an act, event or omission constitutes a ground for extension of time in terms of the Contract and that such an act, event or omission has in fact resulted in insurmountable delay to the Vendor.

f. The application for extension of time made by the Vendor to the Engineer-in-Charge should contain full details of work and time required and reason for the same.

**10. Liquidated Damages**

i. If the Vendor is unable to complete the jobs specified in the scope of work within the period specified in NIT, it may request the3 owner for extension of the time with unconditionally agreeing for payment of LD. Upon receipt of such a request, the owner may at its discretion extend the period of completion and shall recover from the Vendor's running account bill, as an ascertained and agreed Liquidated Damages, a sum equivalent to 0.5% of basic contract value for each week of delay or part thereof. The LD shall be limited to 5% of the total of basic contract value. The parties agree that the sum specified above is not a penalty but a genuine pre-estimate of the loss/damage which will be suffered by the owner on account of delay/breach on the part of the Vendor and the said amount will be payable without proof of actual loss or damage caused by such delay/breach by the Owner.

iii. Notwithstanding what is stated in Clause above, the Owner shall have the right to employ any other agency to complete the remaining work at the risk and cost of the Vendor, in the event of his failing to complete the work within the stipulated time or in the event of the Vendor's work being behind schedule, as judged by the Engineer-In-Charge.

iv. Then the Engineer-In-Charge upon receiving necessary approval from the competent Authority may in writing make a fair and reasonable extension of time for completion of the works as per provision of clauses, provided the Vendor shall make best effort to proceed with the works to the satisfaction of the Engineer-In-Charge. Nothing herein shall prejudice the rights of the Vendor under clause herein above.

**v.** The vendor may seek extension of time for delay or anticipated delay as per clause No. 14.0.5 for reasons not attribute to them and in such a case, the extension may be given without imposition of LD, subject to the satisfaction of the Engineer-In-Charge.

**11. Insurance**

Vendor shall at his own expense carry out and maintain insurance with reputable companies to the satisfaction of the Owner as follows:

**Employee's Compensation and Liability Insurance**:

Vendor shall obtain Workmen Compensation policy in his name in respect of Vendor's employees to be engaged for the work towards compensation as admissible under the Employee's Compensation Act, 1923 and Rules framed thereunder upon death/ disablement and also medical treatment of a worker and the same has to be submitted to the Engineer-in-Charge before commencement of the work. The Owner should be mentioned as Beneficiary. The Vendor shall indemnify the Owner against all losses and claims in respect of injuries or damage to any person, including any employee of the Owner, material or physical damage to any property whatsoever including that of the owner arising out of the execution of the work or in carrying out of the contract, and shall insure against his liability with an insurer until the completion of this contract in terms approved by the owner. Whenever required, the Vendor shall produce the insurance policy and the current premium receipts to the Owner.

In addition to what it is stipulated above, the successful Vendor shall execute Indemnity Bond to indemnify and hold harmless the Owner for complying with the provision of the following:

i) Provident Fund Act for P.F. Scheme for labourers engaged by the Vendor / Sub-Vendors
ii) Interstate Migrant Workmen ("Regulation of Employment and Conditions of Services) Act - 1979
iii) Minimum Wages Act - 1948
iv) Equal Remuneration Act - 1976
v) Employee's Compensation Act - 1923
vi) Contract Labour (Regulation & Abolition) Act - 1970

If any of the work is sublet, after necessary approval by the Owner, the Sub-Vendor has to provide Employee Compensation and Liability Insurance for his employees, in case such employees are not covered under Insurance by the Vendor.

**12. Contractor's Responsibility**

The contractor will be responsible for the welfare and discipline of his employees inside BAIF premises. He must also undertake to comply with all the statutory regulations for employment of his workmen. Any expenses incurred by us under these regulations will have to be reimbursed by him. The contractor will be deemed to be the ultimate employer of his men.

All personnel employed by the contractor are to be engaged as their own employees in all respects and absolve BAIF of any responsibility to this effect.

The laid down safety and security rules and regulation of BAIF shall have to be adhered to. The tenderer shall allow only those workers who have the authorized gate entry permit and will ensure that they use the requisite safety equipment. All entry / exit permit for vehicle, equipment, men and material shall be arranged by the tenderer without any extra cost. The contractor shall ensure that proper uniforms are provided to the personnel deployed by them.

The responsibility to comply with provisions of various labour laws of the country such as Factories Act, Minimum Wages Act, Workmen's Compensation Act, Contract Labour Act, E.S.I Act, Bonus and Gratuity Act, etc. or any other Acts/Rules, which are applicable as per the Statute, will be that of the contractor.

**ANNEXURE II**

**Price Bid**

Tender notice: BAIF Lakkihalli/Jan 02/2024-25 **Last Date of Submission:** January 15, 2025

Date of issue: January 30, 2025

Tender for supply, installation, and commissioning of Offgrid and on grid Solar PV Power Systems for Agrivoltaics (Agri PV) applications at BAIF office, Lakkihalli Tiptur District; location as per the address provided in the technical document.

**Table 1: Offer summary**

**PRICE BID FORMAT PART A. For 90 kWp on grid Solar PV plant (Schedule "A")**

| Item No. | Brief Description | Unit | Qty | In INR | |
|---|---|---|---|---|---|
| | | | | UNIT PRICE | TOTAL PRICE |
| 1 | Turnkey Design, Supply, Installation, Testing & Commissioning of 60kWp on grid with Mono Crystalline PERC Technology and capacity of greater than or equal to 545Wp Solar PV Plant at BAIF | No. | 1 | | |
| 2 | Turnkey Design, Supply, Installation, Testing & Commissioning of 30kWp on grid with Bifacial Mono Crystalline TopCon technology and capacity of greater than or equal to 580Wp Solar PV Plant at BAIF | | | | |
| 3 | GST @ 12% for supply of 60kWp Solar PV Plant. | No. | 1 | | |
| 4 | GST @ 12% for supply of 30kWp Solar PV Plant. | No. | 1 | | |
| 5 | GST @ 18% for services for 60kWp on grid Solar PV Plant | No. | 1 | | |
| 6 | GST @ 18% for services for 30kWp on grid Solar PV Plant | No. | 1 | | |
| 7 | Basic Grand Total | | | | |
| 8 | Total GST | | | | |
| 9 | Grand Total (Including GST) | | | | |

**Total Amount in words Rs. _____**

**_____)**

**PART B: For 90 kWp Off Grid Solar PV SYSTEMS two models of climate smart village (Schedule "B")**

| Item No. | Brief Description | Unit | Quantity | In INR | |
|---|---|---|---|---|---|
| | | | | UNIT PRICE | TOTAL PRICE |
| 1 | Turnkey Design, Supply, Installation, Testing & Commissioning of 90kWp Standalone Solar PV Plants under CSV model. | No. | 1 | | |
| 2 | GST @ 12% for supply of 90 kWp Solar PV Plant. | No. | 1 | | |
| 3 | GST @ 18% for services for 90 kWp Solar PV Plant | No. | 1 | | |
| 4 | Basic Grand Total | | | | |
| 5 | Total GST | | | | |
| 6 | Grand Total (Including GST) | | | | |

**Total Amount in words Rs. _____**

**_____)**

**PART C: For 20 kWp On Grid Solar PV SYSTEMS for operations of two 7.5 hp, pumps with structure mounted on polyhouse (Schedule "C")**

| Item No. | Brief Description | Unit | Quantity | In INR | |
|---|---|---|---|---|---|
| | | | | UNIT PRICE | TOTAL PRICE |
| 1 | Turnkey Design, Supply, Installation, Testing & Commissioning of 20kWp On Grid Solar PV Plant Solar Modules mounted on polyhouse | No. | 1 | | |
| 2 | GST @ 12% for supply of 20 kWp Solar PV Plant. | No. | 1 | | |
| 3 | GST @ 18% for services for 20 kWp Solar PV Plant | No. | 1 | | |
| 4 | Basic Grand Total | | | | |
| 5 | Total GST | | | | |
| 6 | Grand Total (Including GST) | | | | |

**Total Amount in words Rs. _____**

**_____)**

**Table 2: AMC Summary Schedule "D")**

**For AMC- PART A**

| Item No. | Brief Description | Unit | Qty. | In INR | |
|---|---|---|---|---|---|
| | | | | UNIT PRICE | TOTAL PRICE |
| 1 | Annual Maintenance Contract for 90kWp on grid Solar PV Plant at BAIF Year 1 | No. | 1 | | |
| 2 | Annual Maintenance Contract for 90kWp on grid Solar PV Plant at BAIF Year 2 | No. | 1 | | |
| 3 | Annual Maintenance Contract for 90kWp on grid Solar PV Plant at BAIF Year 3 | No. | 1 | | |
| 4 | Annual Maintenance Contract for 90kWp on grid Solar PV Plant at BAIF Year 4 | No. | 1 | | |
| 5 | Annual Maintenance Contract for 90kWp on grid Solar PV Plant at BAIF Year 5 | No. | 1 | | |

**GST will be as applicable.**

**Place_____** **Signature of Tenderer**

**Date_____** **Name & Address**

Signature with seal of bidder

Note: Price Bid and AMC summary must strictly adhere to the above format and must be typed and printed on A4 page.

Signature and seal required on all pages of the Price Bid and AMC summary.

***The work by selected vendors will be periodically reviewed by BAIF team and based on quality of material and service, further orders can be released for additional work.

**For AMC- PART B**

| Item No. | Brief Description | Unit | Qty. | In INR | |
|---|---|---|---|---|---|
| | | | | UNIT PRICE | TOTAL PRICE |
| 1 | Annual Maintenance Contract for 90 kWp off grid Solar PV Plant at BAIF -Year 1 | No. | 1 | | |
| 2 | Annual Maintenance Contract for 90 kWp off grid Solar PV Plant at BAIF - Year 2 | No. | 1 | | |
| 3 | Annual Maintenance Contract for 90 kWp off grid Solar PV Plant at BAIF - Year 3 | No. | 1 | | |
| 4 | Annual Maintenance Contract for 90 kWp off grid Solar PV Plant at BAIF - Year 4 | No. | 1 | | |
| 5 | Annual Maintenance Contract for 90 kWp off grid Solar PV Plant at BAIF -Year 5 | No. | 1 | | |

**GST will be as applicable.**

**Place_____** **Signature of Tenderer**

**Date_____** **Name & Address**

Signature with seal of bidder

Note: Price Bid and AMC summary must strictly adhere to the above format and must be typed and printed on A4 page.

Signature and seal required on all pages of the Price Bid and AMC summary.

***The work by selected vendors will be periodically reviewed by BAIF team and based on quality of material and service, further orders can be released for additional work.

**For AMC- PART C**

| Item No. | Brief Description | Unit | Qty. | In INR | |
|---|---|---|---|---|---|
| | | | | UNIT PRICE | TOTAL PRICE |
| 1 | Annual Maintenance Contract for 20 kWp On Grid Solar PV Plant - Year 1 | No. | 1 | | |
| 2 | Annual Maintenance Contract for 20 kWp On Grid Solar PV Plant - Year 2 | No. | 1 | | |
| 3 | Annual Maintenance Contract for 20 kWp On Grid Solar PV Plant - Year 3 | No. | 1 | | |
| 4 | Annual Maintenance Contract for 20 kWp On Grid Solar PV Plant - Year 4 | No. | 1 | | |
| 5 | Annual Maintenance Contract for 20 kWp On Grid Solar PV Plant - Year 5 | No. | 1 | | |

**GST will be as applicable.**

**Place_____** **Signature of Tenderer**

**Date_____** **Name & Address**

Signature with seal of bidder

Note: Price Bid and AMC summary must strictly adhere to the above format and must be typed and printed on A4 page.

Signature and seal required on all pages of the Price Bid and AMC summary.

***The work by selected vendors will be periodically reviewed by BAIF team and based on quality of material and service, further orders can be released for additional work.

## ANNEXURE III

**List of previous works if any**

| SN | Location | Date of commission | Capacity | Client | Reference contact (name, tel. no.& email) |
|---|---|---|---|---|---|
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |

Signature of bidder with seal

Note: Annexure III should be typed and printed on A4 page adhering to the above format.

**ANNEXURE IV**

**Undertaking**

Date: _____

To

_____

_____

Ref.:Tender notice: BAIF Lakkihalli/Jan 02/2024-25 Last Date for Submission: January 30, 2025

Tender for supply, installation, and commissioning of Offgrid Solar PV Power Systems (Climate Smart Village) for Agrivoltaics (Agri PV) applications at At BAIF office, Lakkihalli Tiptur District; location as per the address provided in the technical document.

Dear Sir,

In response to the tender invited by you, I/We have examined the notice, conditions, specifications and terms of the Tender and I/We agree to abide by all the instructions in these documents attached hereto and hereby bind myself/ourselves to execute the work as per the schedule stipulated in the tender notice.

I/We further agree to sign and execute all agreements/bonds as may be required by BAIF to abide by all conditions of the Tender and to carry out all work as per specifications, failing which, I/We shall have no objection for the forfeiture of the security money deposited with BAIF.

I / We also undertake that I / We have not been blacklisted by any entities any time.

I / We enclose herewith the required documents.

Yours sincerely

Signature of bidder with seal

Encl.:

1. Techno-commercial bid with supporting documents
2. Price bid
3. List of previous works
4. Requested technical evaluation documents Must be submitted with the tender only

**Qualifying Criteria for Bidders:**

**To become eligible, each bidder must satisfy the following;**

| SN | Criteria | Specific Requirement | Documents required |
|---|---|---|---|
| **1.** | **Applicant Entity** | Legal entities duly registered firm under the Companies Act 1956/2013. Or public/semi-public entities, which are financially sound. | Certificate of incorporation / registration GST Registration Certificate; PAN details |
| **2.** | **Technical** | The Vendors shall have experience of having successfully carried out and completed similar works during the last 3 years ending last day of the previous month in which applications were invited<br><br>For PART A: The Bidder must be manufacturer of Solar Based Smart/IOT based automated systems or must be a system integrator having installed at least 2 Off Grid / AC Coupled PV SYSTEM of minimum 50 kWp with installation of LEDs, Pumps, and other loads in the past 2 years.<br><br>For PART B:<br><br>The bidder should be a manufacturer of system integrator of Solar water pumps with an experience of Installation and commissioning of atleast 5 Nos of 15 HP Solar Water pumps in the past 2 years.<br><br>PART C: The bidder must be a System integrator with experience to have installed and commissioned atleast 2 nos of 15 HP kWp or Designed installed and commissioned at least 2 nos off Grid/ Hybrid/ AC Coupled Solar PV Plant of 30 kWp Solar PV Plants in the past 2 years | Work completion certificate for similar nature of work (copy of work order and satisfactorily completion report). |

| | | | |
|---|---|---|---|
| **3.** | **Financial** | Annual Financial Turnover during the last 3 consecutive financial years should be at least Rs. 2.5 to 3 crores. Net worth should be positive.<br><br>The bidder should submit the following,<br>i] Valid Income Tax Clearance Certificate<br>ii] Balance Sheet for the last 3 years.<br>iii] Profit & Loss account for the last 3 years | Proof of Income tax return, audited balance sheet and profit & loss account (certified by CA). |
| **4.** | **Other Technical Requirements:** | • The bidder shall be located within the territory of India and shall be approachable either by road/rail/air.<br>• The bidder shall be fully equipped with the required Infrastructure and facilities as per scope of the work.<br>• The bidder shall have qualified and experienced manpower and skilled workers as per the scope of the work. | • Proof address; registered office and operational sites in India<br>• List of available infrastructure and facilities at operational sites located in India<br>• List of skilled staff with the company giving their experience and qualifications. |

Requested to submit the Proposal and duly sealed and signed Tender in a sealed envelope till 15.1.2025 up to 5.00 pm at our Head Office – BAIF Development Research Foundation, BAIF Bhawan, Dr. Manibhai Desai Nagar, Warje, Pune 411058, India. Each page of the tender document must be sealed and signed. Your signature on the Tender document will be considered as confirmation of your having read and accepted all the conditions laid down in the documents. Along with the tender document, the DD of the Earnest Money must be submitted. The tender will not be accepted without the earnest money. The tender will not be accepted after closure of the time for submission as mentioned above. Prior to submitting a tender, the tenderer shall also inspect the site of the work and acquaint himself with the local conditions, means of access to the site of work, nature of work and all other matters pertaining thereto. The tenderer will be deemed to have satisfied himself by actual inspection of the site and the locality of the works.

Application received after date and time will not be considered. All the hard copies have to be sent to the following address:

Mr. Mahesh Lade
BAIF Development Research Foundation
Dr. Manibhai Desai Nagar, Warje
Pune 411058, India
**Contact Number- +91 9975117673 +91 8459205353**
**Email: someshpande@baif.org.in**