

INVITATION FOR TENDER FOR SUPPLY OF EQUIPMENT

Sealed tender offers are invited from eligible manufacturers or their direct Indian agents (must be listed with DGS @R) for the supply of the following equipment.

- 1. Installation of 30kWp (DC) rooftop mounted Solar Array (Part-I)**
- 2. Installation of 30kWp (DC) rooftop mounted Solar Array (Part-II)**
- 3. Installation of 30kWp(AC) Grid connected roof top Solar Array(Part III)**

Please send offers, in two separate envelopes for technical and commercial along with descriptive catalog/brochure. The validity of the bid should be at least four months (120 days) or more from the date of the opening of this tender please ensure that your quotation reaches not later than 11.11.2017 at 15:00 hours at the following address:

**Prof. Chandan Chakraborty,
Department of Electrical Engineering
Indian Institute of Technology Kharagpur
Kharagpur 721 302, India**

Earnest money of **Rs. 25,000/-** is to be deposited in the form of Account payee Demand Draft in favour of IIT Kharagpur, payable at Kharagpur, India. Any bid which is not accompanied with an EMD shall be summarily rejected. Earnest money deposited will be forfeited if the tenderer withdraws or amends its tender or impairs or derogates from the tender in any respect within the period of validity of its tender. No interest will be paid on the earnest money of the unsuccessful bidders.

Tender reference	IIT/SRIC/EE/RER/CC//2017 -18/EQ- 2 Dated,11.10.2017
Price of the tender document	Rs. 25,000/-
Last date and time for submitting the tender document	11.11.2017 at 15.00 hrs (Indian standard time)
Time and date of opening of bids	11.11.2017 at 16.00 hrs (Indian standard time)
Place of opening tender offers	Department of Electrical Engineering Indian Institute of Technology Kharagpur Kharagpur 721 302, India
Address of communication	As stated above
Contact telephone numbers	03222-283096
Email	cc@ee.iitkgp.ernet.in

TECHNICAL SPECIFICATION 30kWp (DC) rooftop solar Solar Array (Part-I)

Project Installed Capacity	30 kWp (AC) Solar Photovoltaic Power Plant
Solar module type	Multi Crystalline
Capacity of each module	≥ 325 Wp
Generation assuming 2000kWh/m ² annual input irradiance	The average annual insolation (200kWh/m ²) Predicted from different tools like PV system and PV Solution which relies on satellite database
No. of modules	90-100 Nos.
PV System Mounting Structure type	MS Galvanized
Cables and earthing systems	as per requirement
Injection Point	The power injection is done at 415V with net metering arrangement.
Mode of Implementation	By EPC (Engineering, Procurement and Construction)
Project Time Frame	3-4 months

TECHNICAL SPECIFICATION 30kWp (DC) rooftop solar array (Part-II)

Project Installed Capacity	30 kWp (DC) Solar Photovoltaic Power Plant
Solar module type	Mono Crystalline (PERC cell)
Capacity of each module	≥ 340 Wp
Generation assuming 2000kWh/m ² annual input irradiance	The average annual insolation (200kWh/m ²) Predicted from different tools like PV system and PV Solution which relies on satellite database
No. of modules	80-100 Nos.
PV System Mounting Structure type	MS Galvanized
Yearly maintenance and operations	5 Years
Cables and earthing systems	as per requirement

Injection Point	The power injection is done at 415V with net metering arrangement.
Mode of Implementation	By EPC (Engineering, Procurement and Construction)
Project Time Frame	3-4 months

Note: Domestically manufactured PV modules are preferred.

TECHNICAL SPECIFICATION 30kWp (AC) grid connected rooftop solar array (Part-III)

Project Installed Capacity	30 kWp (DC) Solar Photovoltaic Power Plant
Solar module type	Mono Crystalline (PERC Cell)
Capacity of each module	>=360 Wp
Generation assuming 2000kWh/m ² annual input irradiance	The average annual insolation (200kWh/m ²) Predicted from different tools like PV system and PV Solution which relies on satellite database
No. of modules	80-100 Nos.
PV System Mounting Structure type	MS Galvanized
Cables and earthing systems	as per requirement
Injection Point	The power injection is done at 415V with net metering arrangement.
Mode of Implementation	By EPC (Engineering, Procurement and Construction)
Yearly maintenance and operations	5 Years
Project Time Frame	3-4 months

Note: Domestically manufactured PV modules are preferred.

Inverter specifications of Part III

Control Type	Voltage source, microprocessor assisted, output regulation.
Output voltage	3 phase, 415 V AC (+12.5%, -20% V AC)
Frequency	50 Hz (+3 Hz, -3 Hz)
No of Inverters	1-2
Continuous rating (Total)	30-35 kVA with net metering/off Import/Export meters
Normal Power (Total)	30.6 -35 kVA
Total Harmonic Distortion	less than 3%
Operating temperature Rang	0 to 55 deg C
Housing cabinet	Inverter to be housed in suitable switch cabinet, Within IP 20 degree of ingress protection.
Efficiency	98% and above at full load
Yearly maintenance and operations	5 years

Note: Domestically manufactured PV modules are preferred.

Other important Features/Protections of Inverter:

1. Mains (Grid) over-under voltage and frequency protection.
2. Over load capacity (for 10 sec) should be 200% of continuous rating.
3. The Inverter shall be self-commuted and shall utilize a circuit topology and components suitable for meeting the specifications listed above at high conversion efficiency and with high reliability.
4. The Inverter shall be provided with MPPT (Maximum Power Point Tracing) features, so that maximum possible power can be obtained from the PV module.
5. Full proof protection against grid islanding which ensures that the PV power and the grid power gets disconnected immediately in the event of grid failure.
6. The Inverter shall be capable of operating in parallel with the grid utility service and shall be capable of interrupting line-to-line fault currents and line-to-ground fault currents.
7. The Inverter shall be able to withstand an unbalanced output load to the extent of 50%.
8. The inverter shall go to the shutdown/standby mode with its contacts open under the following conditions before attempting and automatic restart after an appropriate time delay in insufficient solar power output.
9. (a)Utility-Grid Over or Under Voltage
The inverter shall restart after an over or under voltage shutdown when the utility grid voltage has returned to within limits for a minimum of two minutes.
- (b)Utility-Grid Over or Under Frequency
The inverter shall restart after an over or under frequency shutdown when the utility grid voltage has returned to the within limits for minimum of two minutes. The permissible level of under/over voltage and under/over grid frequency is to be specified by the tenderer.
10. The inverter shall not produce Electromagnetic interference (EMI) which may cause malfunctioning of electronic and electrical instruments including communication equipment, which are located within the facility in which the PCU is housed.

11. Communication Modbus protocol with LAN/WAN options along with remote access facility and SCADA package with latest monitoring systems.
12. The sine wave output of the inverter shall be suitable for connecting to 415V, 3 phase AC LT voltage grid.
13. The inverter shall incorporate grid islanding protection disconnection of grid & PV power in case of failure of Grid supply suitable DC/AC fuses/circuit breakers and voltage surge protection. Fuses used in the DC circuit shall be DC rated. Transformer less inverters are preferred.
14. The inverter shall have internal protection against any sustained faults and/or lightening in DC and mains AC grid circuits.
15. The kVA ratings of inverter should be chosen as per the PV system wattage.
16. The nominal AC voltage tracking range shall be +10%, -20%.
17. The nominal AC frequency tracking range shall be +/-3Hz.
18. The output power factor should be of suitable range to supply or sink reactive power.
19. Inverter shall provide panel for display of PV array DC voltage, current and power, AC output voltage and current (All 3 phases and lines), AC power (Active, Reactive and Apparent), Power Factor and AC energy (All 3 phases and cumulative) and frequency. Remote monitoring of inverter parameters should also be available.
20. The inverter shall include adequate internal cooling arrangements (exhaust fan and ducting) for operation in a non-AC environment.
21. Max. permissible DC input voltage shall be 1000-1500V.

Factory Testing:

1. The inverters shall be tested to demonstrate operation of its control system and the ability to be automatically synchronized and connected in parallel with a utility service, prior to its shipment.
2. Special attention shall be given to demonstration of utility service interface protection circuits and functions, including calibration and functional trip tests of faults and isolation protection equipment.
3. Factory testing shall not only be limited to measurement of phase currents, efficiencies, harmonic content and power factor, but shall also include all other necessary tests/simulation required.
4. A Factory Test Report (FTR) shall be supplied with the unit after all tests. The FTR shall include detailed description of all parameters tested qualified and warranted.

Other important Features/Protections of Solar Arrays (Part I, II and III)

Note: Only Inverter / PCU is not in the scope for Part I and Part II; However, all other electrical, civil arrangement will be identical for Part I, Part II, and Part III

Earthing

1. PV array, DC equipment, Inverter, AC equipment and distribution wiring shall be earthed as required.
2. Equipment grounding (Earthing) shall connect all non-current carrying metal receptacles, electrical boxes, appliance frames, chassis and PV panel mounting structures in one long run. The grounding wire should not be switched, fused or interrupted.
3. The complete earthing system shall be electrically connected to provide return to earth from all equipment independent of mechanical connection.
4. The equipment grounding wire shall be connected to PV power plant.
5. A separate grounding electrode shall be installed using earth pit per power plant. Test point shall be provided for each pit.
6. An earth bus and a test point shall be provided inside each control room.

7. Earthing system design should be as per the standard practices.

Balance of Systems (BoS)

1. String/Array combiner boxes shall incorporate DC string circuit breakers, DC array disconnect switch, lightning and over voltage protectors, any other protection equipment, screw type terminal strips and strain-relief cable glands.
2. All DC and AC cables shall be terminated using suitable crimped cable lugs/sockets and screw type terminal strips. No soldered cable termination shall be accepted.
3. Only terminal cable joints shall be accepted. No cable joint to join two cable ends shall be accepted.
4. Suitable Ground Fault Detector Interrupter (GFDI) shall be incorporated either with the inverter or with the array combiner box.
5. String/Array combiner boxes shall be secured onto walls or metal structures erected separately on the terrace.
6. Conduits/concealed cable trays shall be provided for all DC cabling on the Roof top. Conduits/concealed cable trays shall be adequately secured onto the roof top/wall.
7. The DC and AC cable type shall be PVC/XLPE insulated, suitably armored, 1100V grade multi-stranded copper conductor. Appropriate color coding shall be used.
8. The DC and AC cables of adequate electrical voltage and current ratings shall be also rated for 'in conduit wet and outdoor use'.
9. The total DC cable losses shall be maximum of 2% of the plant rated DC capacity over the specified ambient temperature range.
10. The DC and AC cable size shall be selected to maintain losses within specified limits over the entire lengths of the cables.
11. DC cables from array combiner box on the rooftop to DC distribution box in the control room shall be laid inside cable duct where available or secured with conduits/concealed cable trays where duct is not available.
12. The DC and AC distribution boxes shall be wall mounted inside control room/open space.
13. DC distribution box shall incorporate DC disconnect switch, lightning surge protectors, any other protection equipment, screw type terminal strips and strain-relief cable glands.
14. AC distribution box shall incorporate AC circuit breaker, surge voltage protectors, any other protection equipment, plant energy meter, screw type terminal strips and strain-relief cable glands.
15. DC and AC cabling between inverter and distribution boxes shall be secured with conduits/concealed cable trays.
16. The total AC cable losses shall be maximum of 1% of the plant AC output over the specified ambient temperature range.
17. All cable conduits shall be GI/HDPE type.
18. All cable trays shall be powder coated steel or GI or equivalent.

Civil

1. Existing roof top space of **Nalanda Complex Administration** building be used to install Solar PV array. Solar panel Assembly arrangement given below.
2. For structural purpose, a "panel assembly" below refers to the panels plus support system that works as a distortion-free integral structural unit.
4. The vertical projection area of the longer side of the panels does not exceed $W/100$ in sqm where W is the gross load of the panel assembly in kg (weight of panels, connections, frames, bracings, pedestals, wiring, circuitry etc.).

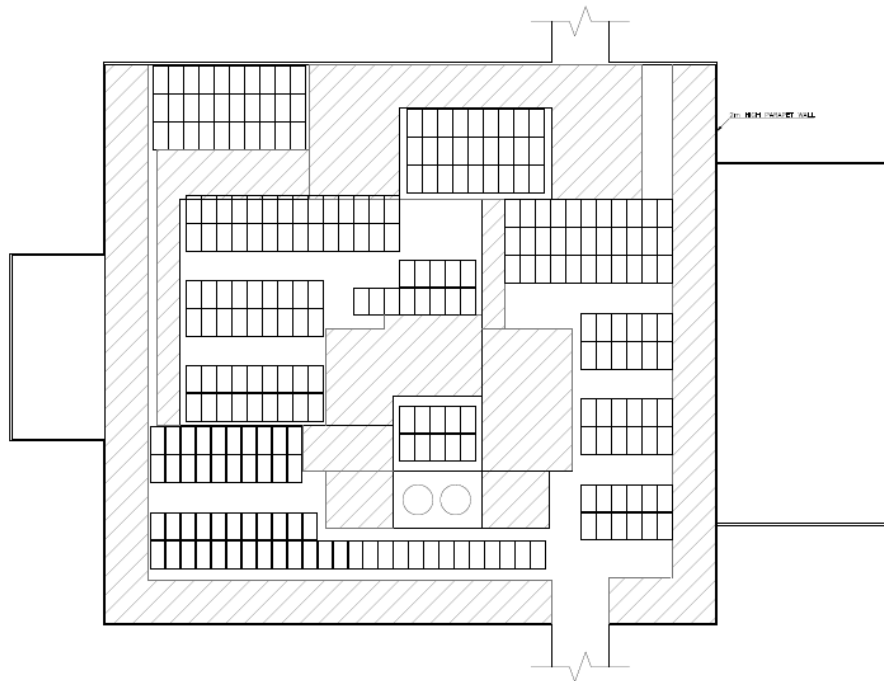
5. PV array shall be installed in the space free from any obstruction and / or shadow.
6. Drainage and roof treatment should not be affected by the installation.
7. PV array shall be installed utilizing maximum space to minimize effects of shadows due to adjacent PV panel rows. The gross weight of the panel assembly should be at most 50-65 kg/sqm (W divided by the plan area).
8. Adequate spacing shall be provided between two panel frames and rows of panels to facilitate personnel protection, ease of installation, replacement, cleaning of panels and electrical maintenance. There is at least 1m clear spacing all around the panel assembly (panel edge to panel edge between assemblies, and panel edge to parapet wall/ room on sides).
9. The maximum column spacing should be 8.5 m c/c or less. The pedestal is placed directly on the roof, over existing roof treatment, without making any structural connection to the roof surface.
10. The panel assembly should have at least 4 pedestal supports. The minimum spacing between pedestals is 1.0 m c/c in any direction. Each pedestal is made of cement concrete. Each pedestal can transmit at most 200 kg load on roof. The plan dimension of pedestal does not exceed 450mm x 450 mm, and height does not exceed 300mm.
11. Ample clearance shall be provided in the layout of the inverter and DC/AC distribution boxes for adequate cooling and ease of maintenance.
12. The Supplier will supply and install required size of Water Tank, pump, pipe etc. for cleaning the PV modules.
13. The supplier shall specify installation details of the PV Panel assembly with appropriate diagrams and drawings. Such details shall include, but not limited to, the following;
 - a) Determination of true south at the site;
 - b) Array tilt angle to the horizontal, with permitted tolerance;
 - c) Details with drawings for fixing the modules;
 - d) Details with drawings of fixing the junction/terminal boxes;
 - e) Interconnection details inside the junction/terminal boxes;
 - f) Structure installation details and drawings;
 - g) Electrical grounding (earthing);
 - h) Inter-panel/Inter-row distances with allowed tolerances; and
 - i) Safety precautions to be taken.

The array structure shall support SPV modules at a given orientation and absorb and transfer the mechanical loads to the roof top columns properly. All nuts and bolts shall be of very good quality stainless steel. Complete Installation work will be under supervision of Engineer of Civil Construction and Maintenance, IIT Kharagpur. The panel support and panel-to-support connection both must be designed by vendor to withstand adequately high wind forces. Civil Works permission does not guarantee safety against flying/falling panels in the event of a storm or any other accident.

Mechanical

1. PV panel assembly may consist of different number of modules with maximum of 10 PV modules. Refer diagram '**Solar Panel Assembly Arrangement**'.
2. Each panel assembly shall incorporate one bird repellent spike at a level higher than the panel upper edge. The location of the spike should be selected for minimum shadow effect.
3. Support structure of panel assembly shall be fabricated using corrosion resistant GI or anodized aluminum or equivalent metal sections.
4. Array support structure welded joints and fasteners shall be adequately treated to resist corrosion.
5. The support structure shall be free from corrosion when installed.
6. PV modules shall be secured to support structure using screw fasteners and/or metal clamps. Screw fasteners shall use existing mounting holes provided by module manufacturer. No additional holes shall be drilled on module frames. Module fasteners/clamps shall be adequately treated to resist corrosion.

7. The support structure shall withstand wind loading of up to 150 km/hr.
8. Adequate spacing shall be provided between any two modules secured on panel assembly for improved wind resistance.
9. The structure shall be designed to withstand operating environmental conditions for a period of minimum 25 years.
10. **The panel assembly design will require approval from IIT Kharagpur before installation of structure and PV modules.**
11. It is required to design the grid structure (on which PV module will be installed) in such a way that all load is transferred to the existing columns of the buildings. Such grid design should be presented to IIT Kharagpur, which will be certified by structural engineers.
12. The panel assembly structure should be installed in a manner to leave sufficient space for repair and maintenance aspects of the roof tops, particularly for leakages.
13. Installation of panel assembly should not tamper with the water proofing of roofs.



Solar panels Assembly Arrangemen

Electrical:

1. LT distribution grid specifications 415V +/- 5%, 50Hz and frequency variation as per IE rules.
3. The inverter output shall be connected to LT line prior to the LT/DG changeover switch. The mandatory islanding protection provided by inverter shall isolate the Solar PV power plant.
4. The time of day (TOD) 3 phase, digital AC load energy meter shall be installed in the Main Distribution Box to monitor energy drawn by building load.

5. The time of day (TOD) 3 phase, digital AC energy meter shall be installed in the AC distribution box to monitor energy generated by Solar PV power plant.
6. The load energy meter operation shall be completely independent of the plant AC energy meter.
7. The energy meters shall be provided with communication interface and necessary data cables for remote monitoring.

Data Acquisition System

1. Data Acquisition System shall be provided for solar PV plant.
2. Computerized DC String/Array monitoring and AC output monitoring shall be provided as part of the inverter and/or string/array combiner box or separately.
3. String and array DC Voltage, Current and Power, Inverter AC output voltage and current (All 3 phases and lines), AC power (Active, Reactive and Apparent), Power Factor and AC energy (All 3 phases and cumulative) and frequency shall be monitored.
4. The time interval between two sets of data shall not be more than 3 minutes. (A min. of 20 samples of data shall be recorded per hour)
5. Data Acquisition System shall have real time clock, internal reliable battery backup and data storage capacity to record data round the clock for a period of min. 1 year.
6. Computerized AC energy monitoring shall be in addition to the digital AC energy meter.
7. The date shall be recorded in a common work sheet chronologically date wise. The data file shall be MS Excel compatible. The data shall be represented in both tabular and graphical form.
8. All instantaneous data shall be shown on the computer screen.
9. Software shall be provided for USB download and analysis of DC and AC parametric data for the plant.
10. Provision for internet monitoring and download of data shall be also incorporated.
11. Software for centralized internet monitoring system shall be also provided for download and analysis of cumulative data of the plant and the data of the solar radiation and environment monitoring system.
12. A data logging system (Hardware and Software) for plant control and monitoring shall be provided with a new Desktop with the following features: 2.7 GHz Pentium with 500 GB HDD, 2 GB RAM, 2 Parallel & 2 Serial Port, Wi-Fi Lan Card, DVD RW Drive, 20" LCD, USB Scroll Mouse, along with 500 VA UPS.
13. Remote Supervisory Control and data acquisition through SCADA software at the purchasers location (two) with latest software/hardware configuration and service connectivity for online/real time data monitoring/control complete to be supplied and operation and maintenance/control to be ensured by the supplier.

Solar Radiation and Environment Monitoring System

1. Computerized solar radiation and environment monitoring system shall be installed on the buildings along with the solar PV power plant.
2. The system shall consist of various sensors, signal conditioning, data acquisition, LCD display and remote monitoring.
3. Global and diffuse beam solar radiation in the plane of array (POA) shall be monitored on continuous basis.
4. Ambient temperature and relative humidity near PV array, control room temperature, wind speed and wind direction at the level of array plane shall be monitored on continuous basis.
5. Solar PV module back surface temperature shall be also monitored on continuous basis.
6. Simultaneous monitoring of DC and AC electrical voltage, current, power, energy and other data of the plant for co-relation with solar and environment data shall be provided.

7. The time interval between two sets of data shall not be more than 3 minutes. (A min of 20 samples of data shall be recorded per hour)
8. Solar radiation and environment monitoring system shall have real time clock, internal reliable battery backup and data storage capacity to record data round the clock for a period of min. 1 year.
9. The data shall be recorded in a common work sheet chronologically date wise. The data file should be MS Excel compatible. The data shall be represented in both tabular and graphical form.
10. All instantaneous data shall be shown on the computer screen.
11. Historical data shall be available for USB download and analysis.
12. Provision for Internet monitoring and download of data shall be incorporated.

Operating Environment

1. Temperature : 5 to 55 Deg. C.
2. Relative Humidity : 100% @ 40 Deg. C
3. Precipitation : 2.46 mm per day (Annual average)
4. Clearness Index : 0.62 (Annual average)
5. Wind Speed : up to 150 km/hr.
6. Corrosion : high
7. Dust : moderate to high
8. Bird Interference : high
9. Bird Droppings : frequent and large
10. Trees : large and in abundance.

Testing, Certification and Approval Schedule

All components, sub-assemblies and system test parameters shall be verified on site to ensure they meet the specifications.

Name of the manufacturer of PV module; name and manufacturer of the solar cell; month and year of manufacture; I-V curve, wattage, I_m , V_m , FF for the module; unique serial no & model no; date & year of obtaining IEC PV module qualification certificate are required to be furnished. Each PV module manufactured in India must have RF identification tag (RFID) compatible with MNRE requirements. (Traceability requirement)

Plant Power Performance Ratio Testing

The overall power performance ratio of the system shall exceed 70%. (Sum total of the system power losses shall not exceed 30%). This allows for elevated module temperature during afternoon hours. For global solar radiation in the Plane of Array (POA) of 1000 W/m^2 , 100kWp PV power plant AC output shall be minimum of 70 kW at any time during the day. Correction shall be applied based on available solar radiation. For example, for 800 W/m^2 radiation, 100kWp PV power plant shall produce min. of 56 kW AC output (70X0.8).

Plant Energy Performance Ratio Testing

The overall energy performance ratio of the system shall exceed 75%. (Sum total of the system energy losses shall not exceed 25%). For global solar insolation in the Plane of Array (POA) of 5 kWh/m^2 (5 Peak Sun Hours) for the day. 100 kWp PV power plant AC energy output shall be minimum of 375 kWh (75kW x 5 hrs.) for the day.

Operation and Maintenance (O&M)

2. DC String / Array and AC Inverter monitoring : Continuous and computerized.
3. AC Energy monitoring : Continuous and computerized.
4. Visual Inspection of the plant : Monthly
5. Functional Checks of Protection Components and Switchgear : Quarterly.
6. Spring Clean PV Array and Installation Area : Quarterly.
7. Inverter, data acquisition, energy meters and power evacuation checks : Half Yearly.
8. Support structure and terrace water-proofing checks : Yearly.
9. O & M log sheet shall be provided and maintained.
10. The repair/replacement work shall be completed within 48 hours from the time of reporting the fault.
11. A half yearly performance report of the plant inclusive of energy generation data shall be provided as per approved format.

Warranties and Guarantees

1. Solar Modules: Workmanship/product replacement for 10 years.
2. Solar Modules: 90% power output for 10 years and 80% power output for 25 years.
3. Inverter: Workmanship/product replacement for 5 years, service for 25 years
4. Power Evacuation and Metering Equipment: Workmanship/product replacement for 10 years, service for 25 years
5. BoS : Parts and Workmanship for 10 years, service for 25 years.
6. Power Plant Installation : Workmanship for 10 years, service for 25 years
7. PV Array Installation : Structural for 25 years
8. Power plant power performance ratio-min 70%
9. Power plant energy performance ratio-min. 75%
10. Annual maintenance for 5 years

Standards and Compliance

1. IEC 60364-7-712 : Electrical Installations of Buildings : Requirements for Solar PV power supply systems.
2. IEC 61727 or similar : Utility Interface Standard for PV power plants > 10 kW.
3. IEC 62103, 62109 and 62040 (UL 1741) : Safety of Static Inverters – Mechanical and Electrical safety aspects.
4. IEC 62116 : Testing procedure of Islanding Prevention Methods for Utility-Interactive PV Inverters.
5. PV Modules : IEC 61730- Safety qualification testing, IEC 61701 – Operation in corrosive atmosphere
6. IEC 61215 : Crystalline Silicon PV Modules qualification
7. String/array junction boxes : IP65, Protection Class II, IEC 60439-1, 3.
8. Surge Protection Devices : Type 2, DC 1000V rated.
9. PV module/string/string combiner box interconnects : MC4 compatible. DC 1000V rated.
10. The central inverter shall be rated for IP54.
11. The DC/AC distribution boxes shall be rated IP54.
12. The data acquisition systems shall be rated for IP54.
13. All DC and AC cables, conduits, cable trays, hardware : relevant IS.
14. Earthing System : relevant IS.
15. PV array support structure : relevant IS.

Warranties

1. Warranty for Modules - 25 years from the Manufacturer
2. Warranty for Inverters - 5 years
3. On rest of the components back-to-back warranty from vendors.
 - a. Defect Notification Periods for Specific Materials:
 - i. TRANSFORMERS – Twelve (12) months from the date of commissioning.
 - ii. LT AND HT PANELS - Twelve (12) months from the date of commissioning

Performance Guarantee: Under EPC services, the Guarantee has to be provided for the performance of the plant as measured by “PR Ratio”. PR ratio guarantee of 75% or above during the handing over period, which will be the base to identify complete handover during commissioning.

GENERAL TERMS & CONDITIONS

PLEASE SPECIFICALLY INDICATE THE FOLLOWING POINTS IN YOUR QUOTATIONS AND COMPLY THE TERMS AS MENTIONED HEREUNDER:-

1. TENDER ARE INVITED COMPLYING THE REQUIREMENT FOR TENDER AS DETAILED IN THE TENDER SPECIFICATION TO BE SUBMITTED IN THE COMPANY’S / FIRM’S LETTERHEAD NEATLY PRINTED / TYPED DULY SIGNED BY AUTHORIZED PERSON WITH THE SEAL OF THE BIDDERS. ALL ENVELOPS CONTAINING THE TENDER SHOULD BE PROPERLY SEALED. SEPARATE ENVELOPS SHOULD BE USED FOR TECHNICAL AND PRICE BID AND INDICATION TO THEIR EFFECT MAY PLEASE BE SUPERSCRIBED ON THE ENVELOP.
2. TECHNICAL CATALOGUE/LEAFLET SHOULD BE ENCLOSED WITHOUT FAIL. PROVIDE COMPLIANCE STATEMENT WITH RESPECT TO THE TECHNICAL SPECIFICATIONS MENTIONED ABOVE.
3. PLEASE CONFIRM WHETHER YOU ARE AUTHORISED TO QUOTE ON BEHALF OF YOUR PRINCIPALS AND IF SO, PLEASE ENCLOSE A COPY OF SUCH AUTHORISATION WITH YOUR QUOTATION.
4. **PERIOD OF VALIDITY:** BIDS SHALL REMAIN VALID FOR ACCEPTANCE FOR A PERIOD OF 120 DAYS FROM THE DATE OF OPENING.
5. **SCOPE OF SUPPLY:** SHOULD INCLUDE INSTALLATION AND COMMISSIONING
6. **PAYMENT TERMS:**
 - a) RUNNING BILLS PROPORTIONATE TO THE PROGRESS OF WORK WILL BE PAID CULMINATING TO A MAXIMUM OF 75% OF THE JOB VALUE.
 - b) 90% OF THE PAYMENT WILL BE MADE FOR ALL ITEMS AFTER COMPLETION OF THE WORK.
 - c) 10% OF THE WORK ORDER VALUE WILL BE RELEASED AFTER 6 MONTHS FROM THE DATE OF COMPLETION OF THE WORK.

- d) THE BANK GUARANTEE (5% OF THE WORK ORDER VALUE) AS PER FORMAT ENCLOSED WOULD SERVE AS A PERFORMANCE GUARANTEE UPTO 5 YEARS AFTER COMPLETION OF THE WORK.
- e) YEARLY MAINTENANCE AND OPERATION CHARGES TO BE CLAIMED EVERY YEAR AFTER COMPLETION OF YEARLY MAINTENANCE.
- f) NO MOBILIZATION ADVANCE.

7. ARRANGEMENT FOR SAFETY PROVISIONS:

IN RESPECT OF ALL LABOUR DIRECTLY OR INDIRECTLY EMPLOYED IN THE WORK FOR THE PERFORMANCE OF THE CONTRACTOR'S PART OF THIS CONTRACT, THE CONTRACTOR SHALL AT HIS OWN EXPENSE ARRANGE FOR THE SAFETY PROVISIONS AS PER SAFETY CODE FRAMED FROM TIME TO TIME AND SHALL AT HIS OWN EXPENSE PROVIDE FOR ALL FACILITIES IN CONNECTION THEREWITH. IN CASE THE CONTRACTOR FAILS TO MAKE ARRANGEMENT AND PROVIDE NECESSARY FACILITIES AS AFORESAID, HE SHALL BE LIABLE TO PAY A PENALTY OF RS.500/- FOR EACH DEFAULT AND IN ADDITION THE EMPLOYER SHALL BE AT LIBERTY TO MAKE ARRANGEMENT AND PROVIDE FACILITIES AS AFORESAID AND RECOVER THE COST INCURRED IN THE BEHALF FROM THE CONTRACTOR.

8. SUBMISSION OF LABOUR RETURN:

THE CONTRACTOR SHALL SUBMIT A STATEMENT TO THE CONCERNED ENGINEER AS FOLLOWS:

- 1. THE NUMBER OF LABOURERS EMPLOYED BY HIM ON THE WORK
- 2. THEIR WORKING HOURS
- 3. THE WAGES PAID TO THEM

9. RULES, FRAMED BY GOVT. TO BE COMPLIED:

IN RESPECT OF ALL LABOUR DIRECTLY OR INDIRECTLY EMPLOYED IN THE WORKS FOR PERFORMANCE OF THE CONTRACTORS PART OF THIS CONTRACT, THE CONTRACTOR SHALL COMPLY WITH OR CAUSE TO BE COMPLIED WITH ALL THE RULES FRAMED BY GOVERNMENT FROM TIME TO TIME FOR THE PROTECTION OF HEALTH AND SANITARY ARRANGEMENTS FOR WORKERS EMPLOYED BY THE CONTRACTORS.

10. TIME AND EXTENSION FOR DELAY:

THE EXECUTION OF THE WORK SHALL COMMENCE FROM THE DATE OF HANDING OVER THE SITE. IN CASE, DELAY IN EXECUTION MUST BE COMMUNICATED TO THE ENGINEER (AUTHORITY) WELL IN ADVANCE WITH PROPER REASONS LIKE: ABNORMALLY BAD WEATHER, SERIOUS LOSS OR DAMAGE BY FIRE, CIVIL COMMOTION, LOCAL COMMOTION OF WORKMEN, STRIKE AFFECTING ANY OF THE TRADES EMPLOYED ON THE WORK.

11. L.D.CLAUSE: @ 0.5% OF THE CONTRACT VALUE PER WEEK OF DELAY SUBJECT TO MAXIMUM OF 10% OF CONTRACT VALUE.

12. COUNTRY OF ORIGIN OF THE GOODS IS TO BE MENTIONED.
13. THE INSTITUTE SHALL PROVIDE THE CONCESSIONAL CUSTOMS DUTY AND EXCISE DUTY EXEMPTION CERTIFICATE AS PER GOVT. NOTIFICATION NO. 51/96 CUSTOMS DATED: 23.07.1996 AND CENTRAL EXCISE DUTY EXCEMPTION IN TERMS OF GOVT. NOTOFICATION NO. 10/97 – CENTRAL EXCISE DATED: 01.03.1997 AS AMENDED FROM TIME TO TIME.
14. **LIQUIDATED DAMAGES:** THE STORES SHOULD BE DELIVERED / DISPATCHED TO DESTINATION AND READY FOR OPERATION NOT LATER THAN THE DELIVERY DATE SPECIFIED. IF THE SUPPLIER FAILS TO DELIVER ANY OR ALL THE STORES OR PERFORM THE SERVICE BY THE SPECIFIED DATE, LIQUIDATED DAMAGES AT 1% PER MONTH OR PART THEREOF IN RESPECT OF THE VALUE OF STORES WILL BE DEDUCTED FROM THE CONTRACT PRICE SUBJECT TO A MAXIMUM OF 5%. ALTERNATIVELY, THE ORDER WILL BE CANCELLED AND THE UNDELIVERED STORES PURCHASED FROM ELSEWHERE AT THE RISK AND EXPENSE OF SUPPLIER.
15. **PATENT RIGHTS:** THE SUPPLIER SHALL INDEMNIFY THE PURCHASE AGAINST ALL THIRD PARTY CLAIMS OF INFRINGEMENT OF PATENT, TRADEMARK OR INDUSTRIAL DESIGN RIGHTS ARISING FROM USE OF THE GOODS OR ANY PART THEREOF IN INDIA.
16. ONLY THOSE BIDDERS WHO'S BIDS HAVE BEEN TECHNICALLY FOUND ACCEPTABLE WILL ONLY BE INVITED FOR PARTICIPATION IN THE PRICE BID.
17. THOSE BIDDERS WHO DO NOT RECEIVE ANY COMMUNICATION FOR PARTICIPATION IN PRICE BID OPENING MEETING MAY PRESUME THAT THEIR BID HAS NOT BEEN ACCEPTED BY THE INSTITUTE.
18. CONDITIONAL OFFER WILL NOT BE ACCEPTED.
19. LATE TENDERS I.E. TENDER RECEIVED AFTER THE DUE DATE AND TIME OF SUBMISSION AS MENTIONED ABOVE SHALL NOT BE ACCEPTED.
20. BIDDERS TO ENCLOSE THE FOLLOWING DOCUMENTS:-
 - A) CURRENT INCOME TAX AND SALES TAX CLEARANCE CERTIFICATES AND PAN NO.
 - A) BANKER'S SOLVENCY CERTIFICATE
 - C) SUMMARY OF AUDITED STATEMENT OF ACCOUNTS FOR THE LAST THREE YEARS TO BE ENCLOSED AND FINANCIAL HIGHLIGHTS AND THE KEY PERFORMANCE DURING THE LAST THREE QUARTERS TO BE ENCLOSED AS PER FORMAT:-

COMPANY'S KEY PERFORMANCE

DESCRIPTION	JAN. TO MARCH	APRIL TO JUNE	JULY TO SEPT.
GROSS REVENUE			
PROFIT BEFORE TAX			
PROFIT AFTER TAX			
RETURN ON INVESTED			
CAPITAL (ROIC)			

- D) CUSTOMER SATISFACTION CERTIFICATE FROM ONE SUCH ORGANIZATION IS TO BE ATTACHED WITH THE TECHNICAL BID AND PRICE BID.
- E) NAME AND ADDRESS OF MINIMUM THREE CLIENTS TO WHOM SUCH EQUIPMENT HAVE BEEN SUPPLIED SHOULD BE MENTIONED.
21. **WARRANTY / GUARANTEE:** THIS COMPREHENSIVE WARRANTY / GUARANTEE SHALL REMAIN VALID FOR **36 MONTHS** AFTER THE GOODS (OR ANY PORTION THEREOF AS THE CASE MAY BE) HAVE BEEN DELIVERED AND COMMISSIONED TO THE FINAL DESTINATION.
22. THE INSTITUTE DOES NOT BIND ITSELF TO OFFER ANY EXPLANATION TO THOSE BIDDERS WHO'S TECHNICAL BID HAS NOT BEEN FOUND ACCEPTABLE BY THE EVALUATION COMMITTEE OF THE INSTITUTE.

ALL TENDERS (UNLESS OTHERWISE SPECIFIED) ARE TO BE SUBMITTED / HANDED OVER TO **DR. CHANDAN CHAKRABORTY , DEPARTMENT OF ELECTRICAL ENGINEERING, INDIAN INSTITUTE OF TECHNOLOGY, KHARAGPUR - 721 302** AND ACKNOWLEDGEMENT TO BE OBTAINED.

IMPORTANT

1. IIT Kharagpur authority may accept or reject any or all the bids in part or in full without assigning any reason and does not bind itself to accept the lowest bid. The Institute at its discretion may change the quantity / upgrade the criteria / drop any item or part thereof at any time before placing the Purchase Order.
2. Promptly make arrangements for repair and / or replacement of any damaged item (s) irrespective of settlement of claim.

3. In case of any dispute, the decision of the Institute authority shall be final and binding on the bidders.
4. For any query pertaining to this bid document correspondence may be addressed to **Prof. Chandan Chakraborty (Name of the PI)**, at the address mentioned above.

LAST DATE FOR SUBMISSION OF SEALED BIDS: 11.11.2017

1) Please Note that the Institute remains closed during Saturdays & Sundays and all specified government holidays.

2) Fax, e-mail Tender will not be accepted.

3) The General Terms and Conditions as stated above relate to supply of stores / equipment /assets etc. and for specific service other terms and conditions of the Institute will apply.
