ODISHA RENEWABLE ENERGY DEVELOPMENT AGENCY
S/59, MANCHESWAR INDUSTRIAL ESTATE BHUBANESWAR-751010, ODISHA

BID DOCUMENT

FOR

Design, Supply, Installation , Testing, Commissioning and Maintenance for a period of 5 years for installation of 10Kwp Off-Grid Solar Photovoltaic Power Plant & 14Kwp Grid Interactive Solar Photovoltaic Power Plant and other related works

At

CMCE Building of OSPCB,Paradeep under ICZM Project.

Tender Call Notice No.283/OREDA,

Dated-28.01.2016.

Tel-06742588260, 2586398, 2585898,2580554,2581552, , Fax-2586368, Web site: www.oredaodisha.com.
E-mail : ceoreda@oredaodisha.com

This bid document along with Annexures as per Index is issued to

M/s _____

_____

_____

_____

Kindly Note:

1. This document is not transferable

2. Though adequate care has been taken for preparation of this document, the bidder shall satisfy himself that the document is complete in all respects. Intimation of any discrepancy shall be given to this office immediately. If no intimation is received from any bidder within ten days from the date of issue of the bid document, it shall be considered that bid document is complete in all respects and has been received by the bidder.

3. The Odisha Renewable Energy Development Agency (OREDA) reserves the right to modify, amend or supplement this bid document.

4. While the bid has been prepared in good faith, neither OREDA nor their employees or advisors make any representation, warranty, express or implied or accept any responsibility or liability, whatsoever, in respect of any statements or omissions herein, or the accuracy, completeness or reliability of information, and shall incur no liability under any law, statute, rules or regulations as to the accuracy, reliability and completeness of this bid document, even if any loss or damage is caused by any act or omission on their part.

OREDA
Tel:(0674)2580
554
Fax: (0674) 2586368
Email:ceoreda@oredaorissa.com Place:
Bhubaneswar

Disclaimer

Kindly Note:

1. This document is not transferable

2. Though adequate care has been taken for preparation of this document, the bidder shall satisfy himself that the document is complete in all respects. Intimation of any discrepancy shall be given to this office immediately. If no intimation is received from any bidder on the pre bid meeting or within ten days from the date of issue of the bid document, it shall be considered that bid document is complete in all respects and has been received by the bidder.

3. The Odisha Renewable Energy Development Agency (OREDA) reserves the right to modify, amend or supplement this bid document keeping in view the necessity in implementation of the scheme.

4. While the bid has been prepared in good faith, neither OREDA nor their employees or advisors make any representation, warranty, express or implied or accept any responsibility or liability, whatsoever, in respect of any statements or omissions herein, or the accuracy, completeness or reliability of information, and shall incur no liability under any law, statute, rules or regulations as to the accuracy, reliability and completeness of this bid document, even if any loss or damage is caused by any act or omission on their part.

DETAILS OF NOTICE INVITING TENDER

Sealed tenders are invited from manufacturers / System integration agency, company of Solar PV systems in the country having valid test certificates from MNRE authorized test centres for their products for Design, manufacture, supply, installation, testing, commissioning and maintenance of the following SPV Power plant under the Special Area Demonstration Project, Ministry of New & Renewable Energy, Government of India.

Sl. No.	Item	Quantity	EMD in shape of DD(Rs)
1	10Kwp Off-Grid Solar PV Power Plant Systems at in the CMCE Building of OSPCB at parade under ICZM Project as per technical specification complete in all respect with 5 years warranty and maintenance	1	Rs. 1,00,000/- (One Lakh only)
1	14Kwp Grid Interactive Solar PV Power Plant Systems at in the CMCE Building of OSPCB at parade under ICZM Project as per technical specification complete in all respect with 5 years warranty and maintenance	1	

Bid document for the above work can be had from OREDA, S-3-59, Mancheswar Industrial Estate, Bhubaneswar-5 on all working days in between 10.00 A.M. to 5.00 P.M. on payment of **Rs. 10,500/-** (Rupees Ten Thousand Five Hundred) only at OREDA cash counter or through Account payee Demand Draft in favour of Chief Executive, OREDA Payable at Bhubaneswar. The bid documents can also be downloaded from OREDA Website (www.oredaodisha.com) . In case of downloaded documents the cost of bid document may be paid in shape of Demand Draft drawn on any Nationalised bank in favour of Chief Executive, OREDA payable at Bhubaneswar. The cost of the bid document in shape Demand Draft has to be submitted along with the technical bid only. The bids shall be accompanied with the required requisite documents as detailed in the bid documents. Bids will be received up to **1.00 P.M** of **11.02.2016** and the technical bid will be opened on the same day at **3.00 P.M** on **11.02.2016** in presence of the bidders or their authorized representatives.

Important Dates

1	**Bid documents to be hosted on website**	**28.01.2016**
2	**Last date of receipt of bid document**	**11.02.2016 up to 1.00 P.M.**
3	**Date of opening of technical bids**	**11.02.2016 at 3 .00 P.M.**
4	**Date of opening of price bid**	**To be intimated**

Check list of documents o be submitted along with the bid by the Bidder.

Sl. No	Particulars	Complied	Page No.
1	Cost of Tender document for Rs.10,500/- or original money receipt issued by OREDA as proof of purchase of tender paper or exempt as admissible with proof.	Bank No Dt	
2	Bank draft for **Rs.1,00,000/-Rupees one lakh only** towards EMD in shape of Bank draft	Bank No Dt	
3	Forwarding letter duly signed and stamped by the bidder		
4	Undertaking duly signed and stamped by the bidder		
5	Document stating the status of the bidder as manufacturer /systems integrator.		
6	Copy of the PAN card of the bidder's firm		
7	Copy of the TIN No. of the bidder's firm		
8	Tax return, Odisha VAT/ STCC/E-submission		
9	Annual turnover in solar business, audited report		
	2012-13		
	2013-14		
	2014-15		
	Total		
5	No of Solar PV Power plant installation, cumulative capacity proof		
11	Proof of production capacity of SPV power plant		
12	Proof of Quality assurance systems, organisation		
13	Valid Test report of module, IEC 61215 & IEC 61730		
14	Valid test report of PCU, IEC		
15	Survey of the site with feasibility report of synchronisation Willingness- Opening of service centre in the state		
16	Undertaking for Indigenous of the supplied item		
17	All accounting statements with auditor's note		
18	Undertaking to unconditionally accept all terms and conditions of the bid document with copy of Board Resolution		
19	Power of attorney to sign the agreement on behalf of bidders		
20	Filled in bid document duly signed and stamped at the bottom of each page except the price bid format.		
21	Organizational profile containing the original documents defining the constitution or legal status, place of registration and principle place of business.		
22	Signed Technical bid in sealed envelop		
23	Price bid in separate single sealed envelop		

Signature of bidder with seal

Forwarding Letter
(To be submitted in the letter head of the bidder)

To,

The Chief Executive,
Odisha Renewable Energy Development Agency (OREDA),
S.59. MIE, Bhubaneswar -751010, Odisha.

Subject: Submission of tender for the work of Design, Manufacturing, Supply, Installation, Testing Commissioning & Maintenance of **10Kwp off-grid SPV power plant & 14Kwp grid interactive SPV power plant** at in the CMCE Building of OSPCB at paradeep under ICZM Project.

Ref: - Tender call Notice No. 283/OREDA, dt. 28.01.2016. .

Sir,

Having studied the Tender document carefully L/we, the undersigned, offer to submit our tender for the work of Design, Manufacturing, Testing, Supply, Installation, Commissioning & Maintenance for **10Kwp off-grid SPV power plant & 14Kwp grid interactive SPV power plant** in conformity of the tender document.

I/We have also read the various provisions of the Tender and confirm that the same are acceptable to us including the provision of CMC. We further declare that any additional conditions, variations, deviations, if any, found in our Tender offer shall not be given effect to. We further understand that **any deficiency / illegibility in documents shall make our tender liable for rejection as non responsive.**

I/we submit our tender understanding fully well that

(a) The bid and other documents submitted along with the same will be subject to verification by appropriate authorities.

(b) OREDA reserves the right to accept or reject any application or the bid process itself without assigning nay reasons thereof and shall not be held liable for any such action.

c) Any genuine changes made by OREDA in the interest of the work with respect to the technical requirement during the course of project implementation will be acceptable.

We hereby declare that all the information and statements made in this proposal are complete, true and correct and also accept that any misinterpretation contained in it may lead to our disqualification.

We hereby declare that our Tender is made in good faith and the information contained is true and correct to the best of our knowledge and belief.

Yours faithfully,

Signature of bidder

UNDERTAKING BY THE BIDDER

I/we here by undertake that

1. We have thoroughly read and examined the notice inviting tender and the tender document along with all its schedules, annexure etc.

2. The rates quoted by us are firm and final and are meant for execution of the allotted work within the time frame stipulated in the tender/work order.

3. All terms and conditions of the tender including the rates quoted by us shall remain valid for a period of one year.

4. In case our tender is incomplete in any respect or we violate any of the prescriptions given ion the tender for submission of the same OREDA shall , without prejudice to any other right or remedy , be at liberty to forfeit the earnest money deposited by us.

5. In case of award of work in our favour OREDA shall have the right to convert the EMD deposited by us in to full or part (as the case may be) of the security deposit to be deposited by us against award of the work.

6. In case we fail to commence or complete the work as per the time schedules or fail to fulfill any of the terms and conditions given in the tender OREDA shall , without prejudice to any other right or remedy , be at liberty to forfeit the security deposit made by us against the award of the work.

7. I/We hereby declare that I/We shall treat the tender documents, specifications and other records connected with the work as secret/confidential and shall not communicate information derived there-from to any person other than a person to whom I/We have authorized to communicate the same or use the information in any manner prejudiced to the safety of OREDA/the State Govt.

8. I/We shall abide by all the laws prevailing at the time of the execution of the work and shall be responsible for making payments of all the taxes, duties, levies and other Govt. dues etc. to the appropriate Govt. departments.

9. Our state commercial tax / TIN registration no. is _____ and
   CST registration No. _____.
   The PAN No. under the Income Tax Act is _____and
   Service Tax Registration No. is _____

10. I/We shall be responsible for the payment of the respective taxes to the appropriate authorities and should I/we fail to do so, I/we hereby authorize OREDA to recover the taxes due from us and deposit the same with the appropriate authorities on their demand.

Signature of bidder with stamp

Dated:

Letter of Authorization

(To be submitted in the letter head of the bidder)

To,

The Chief Executive,
Odisha Renewable Energy Development Agency,
S-59, MIE, Bhubaneswar-751010,
Odisha.

Sub: Submission of tender for the work of Design, Manufacturing, Testing, Supply, Installation, Commissioning & Maintenance of 10Kwp **off-grid SPV power plant & 14Kwp grid interactive SPV power plant.**

Ref:- Tender call Notice No. 283/OREDA, dt. 28.01.2016.

Sir,

I/we hereby authorise Ms./Mr. _____ , Designation .....of our company is authorised to sign all relevant documents on behalf of the company/firm in dealing with the above tender. She / He is also authorized to attend all meetings and submit technical and commercial information as may be required by OREDA.

We further authorise Ms./Mr. _____ designation..... of our company to make technical presentation on behalf of the company, if required.

Signature of the authorised person

1. _____

2. _____

Signature of bidder with stamp

Dated:

DECLARATION

(To be submitted on the letter head of the company)

To,

The Chief Executive,
Odisha Renewable Energy Development Agency,
S-59, MIE, Bhubaneswar 751 010,
Odisha.

Sub:- Submission of tender for the work of Design, Manufacturing, Testing, Supply, Installation, Commissioning & Maintenance of **10Kwp off-grid SPV power plant & 14Kwp grid interactive SPV power plant** atin the CMCE Building of OSPCB at parade under ICZM Project.

Ref:- Tender call Notice No. 283/OREDA, dt. 28.01.2016.

Sir,

I/we hereby declare the following in the context of the aforementioned tender that:

a) The entire tender document has been discussed in the Board meeting and a resolution has been passed for participation in the tender (copy enclosed)

b) We are not involved in any litigation that may have an impact of affecting or compromising the delivery of services as required under this tender

c) We are not blacklisted / defaulted in any manner by any Central / State Government / Public Sector Undertaking in India.

d) In case any false documents submitted and found in future the firms shall be liable to be proceeded against as per prevailing laws.

Yours faithfully,

Authorised signatory

(Stamp).

1. **The Scope of works.**

1.1 The broad scope of the work includes design, supply, installation, testing commissioning & maintenance for 5 yrs warranty with AMC charges payable at the end of each year for **10Kwp off-grid SPV power plant & 14Kwp grid interactive SPV power plant** on the roof top of the ICZM Building.

1.2 A clear understanding of the features of the site building, present control panel for grid interfacing.

1.3 Supply of the complete systems, including all necessary components, sub-components, spares, tools, tackles etc. as per technical specifications given in this document including packing, forwarding, safe storage, handling, commissioning, trial and performance testing and handing over, insurance coverage, operation & maintenance for 5 with warranty including CMC (Annexure-C) for corresponding period.

1.4 Providing pedestals if required for mounting of the PCU'S and control panels.

1.5 RCC structures (matrix of stay / leg / beams) to support the structure, steel frame work depending on design approval should be provided by the bidder.

1.6 Complete water proofing and grading of the building rooftop have to be carried out after installation of structures. Any other work urgently required as per site conditions.

1.7 All structural drawings to be got approved from OREDA / any other competent authority.

1.8 Adequate training has to be provided to the persons to be designated by OREDA in day to day maintenance and upkeep of the installed system. The bidder must also provide a detailed operation and maintenance manual specific to the installed systems.

1.9 Open a local office at Bhubaneswar so as to deliver uninterrupted and sustainable maintenance services.

2. Eligibility Criteria:-

The bidding concern must fulfil all the following criteria for techno-commercial qualification of the tender.

2.1 The bidder must be manufacturer of Solar PV panels / Invertors / ystem integrator who have got their products tested and qualified by any of the authorized test centres.

2.2 The bidder must have valid STCC/ Odisha VAT clearance certificate.

2.3 The bidder must have ICRA/CRISIL Certification.

2.4 The bidder firm must have a minimum annual turnover of Rs 3.00 crore over last three years exclusively in the business of solar PV alone. Bidders should not have incurred losses during any of the last three years.

2.5 The firm must have designed, manufactured, tested supplied, erected, commissioned minimum 200 kwp(cumulative) in the range of up to 10 kwp in govt / PSUs/ Govt agency/ bodies (preference given to the agency who are doing or has completed work under state govt) and which are in successful operation on the date of bid opening.

2.6 The firm must have adequate capacity to design , manufacture, test , supply, erect, and commission the power plant within the given time schedule.

2.7 The products must conform to minimal technical requirements specified under the National Jawaharlal Nehru Solar Mission.

2.8 The firm must have established quality assurance systems and organization in line with the requirements under ISO 9001:2008.

2.9 The farm must not have been debarred / blacklisted by any Govt. Deptt, agency, PSUs / institution / agencies / autonomous organisations. The bidder shall submit a self certification by an authorized person duly notarized to this effect.

3. INSTRUCTIONS TO BIDDERS

3.1 Bidders must submit their bids for one / all items as stated in table above in a **single hard bound** properly page numbered and Indexed. No loose/ separate paper or spiral bound documents will be accepted.

3.2 Bids must be submitted in English language only.

3.3 Incomplete, telegraphic or conditional bids shall not be accepted.

3.4 Prices quoted must be firm and fixed. No price variation / escalation shall be allowed during process of completion of the project.

3.5 The bidders must sign at the bottom of each page of the bid documents at the time of submission in token of unconditional acceptance of the departmental terms and conditions, technical specifications etc**.**

3.6 Valid TIN / Odisha VAT/ Sales tax clearance certificate duly attested must be submitted along with the bid.

3.7 The firm must have been electrified minimum 100 Villages under RVEP program in ODISHA.

3.8 The Firm must have NSIC registered and Micro and Small Enterprises (MSEs) registered in ODISHA circle.

3.9 The production capacity of the firm must have 20nos of 10KWp/monthly.

3.10 Deviations in terms and conditions, Specification of material, Inspection clause etc. will not be accepted under any condition.

3.11 The bidders should furnish the information on all past supplies and satisfactory performance.

3.12 The bidder shall submit copies of documents defining the constitution or legal status, place of registration and principle place of business of company or firm or partnership.

3.13 The bidder shall furnish a brief write up backed with adequate data, explaining his available capacity and experience (both technical and commercial) for the manufacture and supply of the required systems, equipments within the specified time of completion after meeting all their commitments.

3.14 The bidders shall submit reports on financial standing of the bidder such as audited profit and loss statements, balance sheets and auditor's reports for the past, bankers' certificates. All accounting statements submitted should be duly audited and with proper auditor's note on accounts and accounting standards.

3.15 Earnest money as specified in bid may be deposited in cash at OREDA cash counter or in shape of Demand Draft drawn in favour of the Chief Executive, OREDA payable at Bhubaneswar from any nationalized bank or BG as per standard format valid for 6 month**. Bids without E.M.D will not be accepted (other than NSIC certified holder).**

3.16 Bids received late due to postal delay or otherwise **will not be considered**.

3.17 The bidders are required to furnish their offers in the price bid both in words & figures. In case of corrections ,if any, the original text/numerical must be clearly crossed out and re-written legibly above, below or on the side of the crossed out characters as per availability of space and the authorized person must put his dated initial under such corrections. In case of any conflict between figures and words, the latter shall prevail.

3.18 Since timely execution of works is of paramount importance, requests for extension of time shall not be ordinarily entertained.

3.19 Canvassing in any manner shall not be entertained and will be viewed seriously leading to rejection of the bid.

3.20 Certificate to the effect that the systems to be supplied are indigenous & not fully imported must be furnished.

3.21 The bidders must be having / willing to open a local office at Bhubaneswar before commencement of work for close coordination with OREDA.

3.22 Power of attorney to sign the agreement on behalf of bidders & partnership deed articles, if any, should be enclosed along with original bid documents.

3.23 Notice inviting tender, bid documents, prescribed Technical bid, price bid, terms & conditions will form the part of the tender.

3.24 All pages of the bid documents must be signed & sealed by the authorized person on behalf of the bidders.

3.25 Bids will be accepted & will be opened as per information mentioned in the notice-inviting tender. No receipt against submission of bid shall be issued by OREDA.

3.26 A pre bid meeting was convened. The corrected revised and final document is uploaded which shall be submitted as complied in the technical bid document.

3.27 The last date of receipt of the bid is 11.02.2016 up to 1.00 P.M. Sealed tenders may only dropped in the specified tender box kept in the Support Service Division, OREDA during office hours on working days. Bids received after due date & time will not be considered. The bids of such firms shall only be considered who have purchased the bid documents from the Agency by depositing the prescribed fee of the bid document (Non refundable) / downloaded from the website and submitted along with cost of the tender paper in shape of DD drawn in favour of Chief Executive OREDA from any nationalised bank. If due to any reason the due date is declared as a holiday the bid will be opened on next working day at the same time.

3.28 The technical bid shall be opened on 11.02.2016 at 3.00 P.M. in the OREDA office, Bhubaneswar in presence of such bidders or their authorized representatives, who may like to be present at the time of opening.
Please attach all proofs

3.29 The bid document should be submitted in two parts as detailed below:

3.29.1 Bids should be submitted in two separate sealed envelope as mentioned below & addressed to the Chief Executive, OREDA, Bhubaneswar -5, inside a sealed envelope superscribed " Bid for Solar PV systems under against the Tender Call Notice No.283/OREDA dated.28.01.2016. First sealed envelope should contain Technical Bid prescribed test certificate, Earnest Money, Technical Specification, valid VAT / Sales tax clearance certificate , Commercial terms & conditions, other bid documents duly signed & sealed, Indigenous Certificate, organizational profile, balance sheets and profit & loss accounts for last three years, certificate and proof as per qualification criteria as well as brochure, literature etc. It should be super-scribed with Part-1 Technical Bid ". All the papers of bid documents except the price bid duly signed should be submitted in the first envelope. Required earnest money deposit in the form of Demand draft in favour of Chief Executive, OREDA payable at Bhubaneswar should be attached. If the bid document has been downloaded from the website, the bank draft towards cost of bid document should be submitted in a separate envelop superscribed “cost of bid document”and kept in the main envelop.
In case of non remission of “cost of bid document” no other documents will be entertained and shall stand rejected. If any bid document indicates price in part

3.29.2 Second sealed envelope (part-II) should contain Price bid in a separate sealed envelope. It should be super-scribed with "PART- II PRICE BID". Any condition in regard to financial aspects, payments, terms of rebate etc beyond the prescribed financial terms of OREDA will make the bid invalid. Therefore it is in the interest of the bidders not to write anything extra in the Price Bid in Annexure-B except price.

3.30 The procedure of opening of the bid shall be as under

3.28.1. First envelope "PART-1 TECHNICAL BID” shall be opened at the time & date mentioned in the bid notice by OREDA representative in the presence of bidders, who choose to be present.

3.28.2 Second envelope (part-II) containing Price bid shall be opened after evaluation of technical-commercial suitability of the offer by assessing responsiveness in line with the requirements mentioned in the bid document. The date for opening of second envelope (Price bid) shall be communicated subsequently. Second envelope of price bid only those bidders shall be opened who qualify in the technical bid. If necessary, the firms may be called for Technical Presentation of their product as per the time intimated by OREDA.

3.31 All Taxes applicable at the time of supply (from the date of consignment) will admissible.

3.32 In case of supply of any defective material or substandard material, the materials will be rejected & it will be the responsibility of the supplier for taking back & replacing the rejected materials at their own cost. In case of non-lifting of such rejected materials within a reasonable time offered by the office it will have the right to suitably dispose off the same and forfeit the amount.

3.33 The supplied materials should strictly comply with the specifications as mentioned in the bid, otherwise the material would be liable for rejection.

3.34 Any clarification on the technical specification and commercial terms and conditions may be clarified in writing from OREDA.

3.35 Deviation of any commercial terms and condition and technical specification shall not be entertained under no circumstances.

3.36 Bidders may in their own interest visit the sites and undertake site visit before submitting bids. OREDA will not be responsible for any incidental or consequential losses of the firms while execution and till expiry of the period of maintenance.

3.37 All the bidders shall essentially indicate the break-up of prices as shown in Price bid.

3.38 During the warranty period, MNRE/ State Agencies/ Users reserve the right to cross check the performance of the systems with the minimum performance levels specified in the MNRE specifications.

3.39 The Chief Executive, OREDA shall award the contract to the successful bidder whose bid shall be qualified after evaluation in terms of the responsiveness and lowest rate determined on the basis price bids.

3.40 On award of contract the qualified bidder shall be termed as contractor / supplier / executor /turnkey operator.

4 **Acceptance/ Rejection of the bid documents:**

Chief Executive, OREDA reserves the right to reject or accept any bid or annul the bidding process at any time prior to award of contract, without having prejudice of incurring any liability to the affected bidders or any obligation to inform the bidders.

Chief Executive

I/we have carefully read & understood the above terms & conditions of the bid & agree to abide by them.

Signature of Bidder with Seal

5. COMMERCIAL TERMS & CONDITIONS:

5.1 **Rate:**

The offer should indicate the unit cost of the system, Installation & Commissioning charges, CMC Charges and taxes & duties separately. The unit cost must be inclusive of packing, forwarding, loading & unloading charges, cost of insurance and transportation FOR destination where the system will be installed as per the work order.

5.2 **Sales Tax & Duties etc.:**

All Taxes and duties as prescribed both under Central and State Government sales tax rules would be applicable.

5.3. **Earnest Money Deposit:**

5.3.1 Earnest money deposit as specified in the Table above is required to be deposited along with the bid without which the bid will not be accepted. No interest will be payable for the EMD amount under any circumstances.

5.3.2 Earnest money can be deposited in cash at OREDA cash counter or, submitted in shape of a Demand Draft in favour of Chief Executive, OREDA from any Nationalised Bank Payable at Bhubaneswar and the proof of deposits should be attached to the bid. E.M.D would be refunded to the unsuccessful Bidders after finalization of the bid without any interest. EMD in shape of BG in standard format (Annexure-E) valid for 6 month shall also be accepted.

5.3.3 E. M. D would be adjusted against security deposit in case of successful bidders.

5.3.4 E. M. D would be forfeited in case of non- compliance of the purchase order by the successful bidder.

5.3.5 In case of claim for exemption from deposit of Earnest money sufficient proof in support of claim for exemption of EMD as prescribed in Govt. of India Notification is to be attached with the bid.

5.4 Programme Execution Schedule:

5.5.1 Delivery of systems at sites:	2 (Two) months from the date of handing over the roof top to the vendor for the purpose of erection of the PV power plant.
5.5.2 Installation & commissioning:	1(one) month from the date of preliminary inspection, physical verification. and handing over of systems for installation.

The above dates are extendable by another one month under exceptional circumstances.

5.5.3 Upon intimation about commissioning of the systems by the executing firm a joint inspection will be carried out by the representatives of the executing firm, OREDA and other officers from Govt of Odisha / Govt. of India.

5.5.4 The issuance of a JCC shall, in no way relieve the executing firm of it's responsibility for satisfactory operation of the power plant.

5.6 Validity of offer:

The offer must be kept valid for a period of 180 days from the date of opening of the technical bid or till the completion of the project whichever is later. No escalation clause except the admissible tax component under the period of consideration would be accepted.

5.7 VAT:

The bidders must submit attested copy of valid up to date VAT clearance certificate along with the bid. The bid would not be considered without this document.

The original certificate would be produced at the time of opening of the bid, or, before placement of purchase order, if required.

5.8 Warranty:

The complete system should be warranted against any manufacturing defect or bad workmanship at least for a period of 5 (five) years from the date of commissioning of the systems.

Major system subcomponent SPV modules must be warranted against any manufacturing defect of bad workmanship for a period of 5 years.

Warranty certificate to the above effect must be furnished along with the commissioning reports. .Any defect noticed during warranty period should be rectified/replaced by the supplier free of cost upon due intimation by OREDA.

5.9 Penalty and termination of contract:

The systems shall be supplied, installed and commissioned within the scheduled time. If the bidder fails to adhere to the schedule, OREDA shall without prejudice to its other remedies under the contract deduct from the contract price as liquidated damages a sum equivalent to 1% of the delivery price of the delayed goods or unperformed services for each week of delay until actual delivery or installation/commissioning up to a maximum deduction of 5% of the contract price for delayed goods or installation and commissioning. Once the maximum is reached (i.e 5 weeks of delay) OREDA may consider termination of the contract and forfeit the security deposit without prejudice to the other remedies of the contract**.**

However, Chief Executive, OREDA may at his own discretion allow reasonable time extension upon written application of the supplying firm. If the delay is considered intentional or due to the negligence of the vendor, no extension can be allowed with imposition of penalty. If the delay is considered to be genuine time extension can be allowed without imposition of penalty.

5.10 Force Majeure:

The supplier of the SPV system shall not be charged with liquidated damages nor shall his security for performance be forfeited when failure of the supplier in making delivery is due to any event beyond the control of the supplier and could not have been foreseen, prevented or avoided by a prudent person. These include, but are not restricted to acts of nature, acts of public enemy, acts of Government, fires, floods, epidemics, strikes, freights, embargoes and unusually severe weather.

5.11 Inspection:

5.11.1 Pre delivery inspection of solar PV modules and other major components will be carried out by a team of designated officials of OREDA, any other department as may be considered appropriate at the factory site of the vendor / manufacturer. Before despatch of consignment intimation shall be given sufficiently ahead so that no delay occurs for deputing officials and inspection at the premises / test site.

5.11.2 The rest of the tests and inspections shall be made at the place of delivery. Officers authorized by OREDA shall be entitled at all reasonable time to inspect and supervise and test during erection and commissioning. Such inspection will not relieve the executing firm of their obligation in the contract.

5.11.3 OREDA shall have the right to have the tests carried out at its own cost by an independent agency at any point of time.

5.12 Payment:

90 % of the system cost and 100% taxes on systems supplied shall be released upon commissioning of the systems at the location specified in the purchase order and verification by the concerned officer of OREDA. Balance **10%** cost of the supplied materials, Installation & Commissioning charges will be released after 3 months successful performance of the systems and submission of all recommended reports and returns (JCC, warranty, GPS based photograph, Web enabled generation report, I-V curves, Operation manuals etc dos & don'ts in the form of a booklet, conducting training programme, if necessary and or as mentioned in the work order). in the form of a booklet and conducting training programme.

5.13 Execution:

Execution of work shall be carried out in an approved manner as outlined in the technical specification or where not outlined, in accordance with relevant Indian Standard Specification, to the reasonable satisfaction of the Authorized OREDA Officer.

5.14 Comprehensive Maintenance Contract (CMC):

The bidder must enter into a Comprehensive maintenance contract for the specified period at the time of execution of the order. Offer without such CMC shall not be considered.(sample format of CMC enclosed at Annex -) The scope of CMC must cover supply of spare parts (including wherever necessary) / services during the contract in force. Order shall be placed on bidders who agree to offer such CMC. The CMC charges quoted by the bidder must be realistic in view of actual rendering of after sale services. The payment of annual maintenance charges under the Comprehensive Maintenance Contract shall depend upon the functionality of the system duly certified by the concerned Authorised officials of OREDA.

5.15 Limitation of Liability:

OREDA, will, in no case be responsible for any accident fatal or non-fatal, caused to any worker or outsider in course of transport or execution of work. All the expenditure including treatment or compensation will be entirely borne by the Executants. The Executants shall also be responsible for any claims of the workers including PF, Gratuity, ESI & other legal obligations.

5.16 Dispute:

For adjudication of any dispute between OREDA and the bidders arising in this case, reference can be made to any Law courts under the jurisdiction of Odisha High court only. The Chief Executive, OREDA reserves the right to accept or reject any or all bids without assigning any reason thereof.

Chief Executive

I/We have carefully read and understood the above terms and conditions of the bid and agree to abide by them.

SIGNATURE OF BIDDER WITH SEAL

TECHNICAL SPECIFICATION 10KWp SPV Systems

The general scope under this contract includes to design, manufacture, testing, inspection, packing and forwarding, transportation up to project site, loading & unloading, storage in safe custody, erection, carrying out preliminary tests at site, commissioning, performance testing, operation and maintenance for 5 years & handing over to all the equipment of SPV Power plant on the respective sites / as per instruction from time to time. The illustrative Schedule of requirements is in accordance with the specifications contained in this document

System Detail for 10KWp Off-Grid Solar PV Power Plant:

Sl. No.	Brief Description	Units	Make
1	SPV modules for a 10 Kwp Off-Grid Solar PV Power Plant, as per specifications.	1 Set	Compliant to bid document spec's
2	SPV module mounting structure suitable for accommodating 10 KWp capacity SPV modules including foundation as per specifications on rooftop	1 Set	As per BIS
3	PCUs as per specifications	1 Set	SMA / OPS/Schneider/KACO Siemens / ABB / Emerson / equivalent
4	Battery Bank as per Specification (120V 700AH)	1 Set	GEL/VRLA/Tubular Plate Lead Acid/Low Maintenance type.
5	Array Junction Boxes (Optional)	1 Set	Tyco / Hensel/ spelberg / equivalent
6	Main Junction Boxes(optional)	1 Set	Tyco / Hensel/ spelberg / equivalent
7	DC Distribution units as per specifications	3 Sets	Siemens / ABB / Schnieder Electric/ L&T / equivalent
8	AC Distribution units as per specifications	3 Sets	Siemens / ABB / Schnieder Electric/ L&T / equivalent
9	Cables requirement as per design	Mtrs. As required at site for full plant commissioning	Finolex / Polycab / Havells /equivalent
5	Fire extinguisher in accordance with BIS codes for electrical short circuit fires along with sand buckets	1 Set	
11	Lightning arrester complete set as per specification	2 Sets	BIS compliant

12	SPD (Protection device)	One set	
13	Earthing complete set as per specification	2 Sets	BIS compliant
14	Recommended underground /sealed cabling up to distribution control panel		
15	Providing training to engineers and site staff for operating Maintenance and trouble shooting skills, if necessary		

Solar PV Modules:
The PV modules must have quality to the latest edition of any of the following IEC PV module qualification test or equivalent BIS standards for module design qualification and type approval:. Crystalline Silicon Solar Cell Modules IEC 61215 Edition (II)

PV modules must have quality to IEC 61730 Part I & II, for safety qualification testing and to be used in a highly corrosive atmosphere throughout their lifetime, they must qualify to IEC 61701.

PV modules used in solar power plants must be warranted for output wattage, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years.

Full rated output of the SPV Array to be ensured after one year of operation. Number of modules and array capacity will depend on the rated output of individual modules. The peak power rating of the Solar PV array should not be less than as per rated capacity of PV Module.

RFID tag shall be mandatory placed inside the module laminate.

Module Mounting Structure:
Solar PV modules are to be installed & fixed with the module mounting structures with appropriate size stainless steel nuts & bolts.

The array structure shall be made of hot dip galvanized MS angles of size not less than 50mm X 50mm X 6 mm size. The minimum thickness of galvanization should be atleast 80 microns and for coastal area 120 microns. All nuts & bolts shall be made of very good quality of stainless steel. The minimum ground clearance of the lowest part of the module structure shall be 500 mm.

The structure shall be designed for simple mechanical and electrical installation. It shall support SPV modules at a given orientation, absorb and transfer the mechanical loads to the ground properly. There shall be no requirement of welding or complex machinery at site.

Array Foundation:
The legs of the structures made with hot dip GI angles will be fixed and grouted in the RCC foundation columns made with 1:2:4 cement concrete. The minimum ground clearance from the lowest part of any module shall be 500mm. While making foundation designs due consideration will be given to weight of module assembly, maximum wind speed of 200 Km per hour. The work includes necessary excavation, concrete-ing, back filling, shoring & shuttering etc.

Junction Boxes (JBS):
The junction boxes shall be dust and waterproof and made of thermo-plastic. The terminals will be connected to copper lugs or bus bar of proper sizes. The junction boxes will have suitable cable entry points fitted with cables glands. Suitable markings shall be provided on the lugs or bus bar for easy identification and cable ferrules will be fitted the cable termination points for identification. Each main junction box shall be fitted with appropriate rating blocking diode. The junction boxes shall be of reputed make.

The junction boxes shall have suitable arrangement for the followings:
Combine groups of modules into independent charging sub-arrays that will be wired into the controller.

Provide arrangement for disconnection for each of the groups.

Provide a test point for each sub-group for quick fault location.

To provide group array isolation.

The rating of the JBS shall be suitable with adequate safety factor to inter connect the Solar PV array.

Battery Bank:
There will be one battery bank comprising of appropriate capacity for respective SPV Power Plant (Off-Grid). The batteries should be of tubular plate lead acid & low maintenance type or Gel / VRLA Type and shall have long service life. The cells should confirm IEC 61427 / IS 1651 / IS 133369 and as per specification given below shall be provided.

Container	Polypropylene Co-polymer/hard rubbers with carrying handle.
Cover	Protective cover of polypropylenes against dirt & possible short circuit.
Terminals	Made of lead alloy suitable for bolted connection. The terminals should be greased with petroleum gel.
Electrolyte	Battery grade Sulphuric acid
Self Discharge	Less than 3% per month at 30 degree C
Life expectancy	1500 cycle duty at 27degree C at 80% depth of discharge 3000 cycle duty at 50% discharge.
Voltage	2 Volt
Approval	Batteries shall have to be approved by ERTL or CPRI or any MNRE approved test centers
Service Life	Should perform satisfactory for a minimum period of 5 year under operating conditions as mentioned.

Each battery bank will contain suitable wooden rack or Mild Steel, hydrometer, thermometer, cell tester and connecting leads etc.

Power Conditioning Unit (PCU)
As SPV array produce direct current electricity, it is necessary to convert this direct current into alternating current and adjust the voltage levels before powering equipment designed for nominal mains AC supply. Conversion shall be achieved using an electronic Inverter and the associated control and protection devices. All these components of the system are termed the “Power Conditioning Unit” OR simply PCU. In addition, the PCU shall also house MPPT (Maximum Power Point Tracker), an interface between Solar PV array & the Inverter, to maximize Solar PV array energy input into the System. PCU should conform IEC 61683, IEC 60068 as per specifications.

PCU refers to combination of charge controller, inverter and AC charger and shall be supplied as integrated unit or separate units.

Inverter:

The inverter will be highly efficient. The inverter should confirm IEC 61683 / IEC 60068 and should be based on MPPT design. Inverters would display its own parameters and the parameters of battery bank connected to the inverter. Beyond the maximum load the inverters will trip. The inverters should be designed to be completely compatible with the charge controllers and distribution panels and are of integrated design.
Salient features of the Inverters shall be as follows:

Regulation	From minimum to maximum voltage 1%
Output frequency	50 Hz +/- 0.5 Hz
Overload Capacity	200% for 30 Second.
Efficiency	80% at 50% of load and More than 90% at full load 0.8 PF
Short Circuit Protection	Circuit Breaker and Electronics protection against sustained fault.
Low Battery Voltage	Automatic Shut Down
Total Harmonic Distortion	Less than 3%
Over Voltage	Automatic Shut Down
AC over Current/Load	Automatic Shut Down
Protection	Over Voltage both at Input & Output Over Current both at Input & Output Over Frequency Surge voltage inducted at output due to external source.
Protection Degree	IP65
Instrumentation & Indication	Input & Output voltage, Input & Output Current, Frequency, Power output, different status of inverter, kind of fault by audio signal.

Charge Controller Unit:

The Charge Controller shall be dual input type, where under normal condition the input is fed from a SPV panel and in the absence of SPV power or low SPV power conditions an external single phase AC source can be used for battery charging. A selector switch shall be provided for choosing between those modes. When the batteries are charged from external AC sources, the charging current should be set manually depending on the capacity of the source and the charging requirement of the batteries. The charge controller shall be of MPPT type / PWM type employing IGBT switching elements.
Charge controller should confirm IEC 62093 / IEC 60068 as per specification.

The charging sequence from SPV array or external AC source shall be as follows:

From SPV Array:
The battery shall be charged at the maximum rate depending on the solar radiation until the battery terminal voltage reaches 2.25 volts per cell. The battery charging should be automatically terminated when the rate of increase of battery voltage is steady (dv / dt sensing). The charger shall switch on the „trickle charge after this.

From AC Source:
The battery shall be charged at the rate manually set depending on the battery condition or capacity of AC source. The maximum rate shall be internally preset.

The battery charging should be automatically terminated when the rate of increase of battery

voltage is steady (dv / dt sensing) or when the battery terminal voltage reaches 2.75 volts per cell.
Salient features of the Charge Controller shall be as follows:

Switching elements	IGBT
Type of Charger	PWM
Input :	From Solar PV array
Output Voltage:	Suitable for charging nominal battery bank from respective capacity of SPV array.
Protections:	Short Circuit, Deep Discharge, Input Surge Voltage, Over Current (load), Battery Reverse Polarity, Solar array reverse polarity.
Indication :	String „ON", Main „ON", Charging „ON", 80% Charged, 100% Charged, Charger Overload, Battery On Trickle.

Battery disconnected / Fault Battery Reverse Polarity, Low Solar Power, System Fault and Charger over Temperature and Input Over / Under Voltage (for AC).

MIMIC Diagram: To indicate power flow and operation of the charge controller/ battery charger; shall have provision for visual indications of existing power input/output through MIMIC diagram.

You may design Power Conditioning Unit (PCU), which consist of a solar charge controller & inverter as per design mentioned above. In addition, it should have a Grid Charger.

It provides the facility to charge the battery bank either through Solar or Grid set. The PCU continuously monitors the state of Battery Voltage, Solar Power output and the loads. Due to sustained usage of power, when the Battery Voltage falls below a preset level, the PCU will automatically transfer the load to the grid power and also charge the

Batteries through the in-built Grid Charger. Once the batteries are charged to the present level, the PCU cuts off the Grid power from the system and will restore to feeding the loads from the battery bank & continue to charge the battery bank from the available solar power.

The PCU always gives preference to the solar power and will use Grid power only when the solar power / battery charge is insufficient to meet the load requirement.

Salient Features:
Priority of charging is from Solar Panels.

Over heating Protection.

Dual Display Showing PV & Inverter output.

Short circuit & Over load Protection.

Inbuilt Heavy Duly Solar Charge Controller.

No Load Shut Down for load = 5% 9not applicable for > 1 kVA systems)

Fully equipped with powerful Grid Charger.

User friendly client and Web based Software.

AC Distribution Panel Board:

The AC Distribution Board shall consist of the components as per designed PCU.

Cables & Wirings:
All cables to be supplied should be as per IEC 60189 / IS 694 / IS 1554 and should have proper current carrying capacity. The cable shall be PVC insulated PVC sheathed copper conductor.

Supplier shall be responsible for providing the wiring as per the standard method of construction. The wiring of from PV Arrays to inverter shall be provided in rigid PVC 20mm – 40mm conduit run on wall/ ceiling etc. including entries through the wall /slabs/flooring as per requirement with necessary accessories/ hardware‟s such as spacers, saddles, bends, tees, junction Boxes, check nuts / glands etc. The conduits shall be erected/laid in such a way that no leakages, cracks can formed & wires shall not be exposed to environment.

The earth wire of 2.5 Sq. mm PVC insulated copper wire, minimum FR grade insulation, electrolyte copper conductor of having insulation of 1.1KV grade, ISI marked with appropriate colour coding shall be provided. Earth continuity of PVC insulated wire of 2.5 sq. mm having insulation of 1.1KV grade, ISI marked, green or yellow colour shall be provided to arrays frame. Suitable size & appropriate type of lugs shall be provided to wires.

All cables and wires used shall be of copper conductors of suitable cross-section with crossed linked polythene or polyvinyl insulated with polyvinyl sheath. Stranded and flexible cable shall be used. Non-stranded cable shall not be acceptable except otherwise mentioned and permitted.

Conductor size of cables and wires shall be selected based on efficient design criteria such that the overall electrical energy loss in any section of cable or wire is not more than 3% under the designed operating conditions. Conductor size of appropriate capacity must be used.

Cable/wire connections shall be soldered, crimp-on type or split bolt type. Wire nut connections shall not be used.

All cables shall be adequately supported. Outside of the terminals/panels/enclosures shall be protected by conduits. Cables shall be provided with dry type compression glands wherever they enter junction boxes/panels/enclosures.

All cables shall be suited marked or coded for easy identification. Cables and wires shall confirm to the relevant standards suppliers to specify the specification.
The wiring must be carried out in casing capping only.

Danger plates:
You shall provide at least 8 Danger Notice Plates of 200 mm X 150 mm made of mild steel sheet, minimum 2 mm thick and vitreous enameled white on both sides and with inscription in signal red color on front side as required. The inscription shall be in English and local language. Out of eight, four danger notice shall have to be provided at PV Yard & Four-danger notice at Control Room & Battery room.

Lightning & Over Voltage Protection System:
The SPV power plant should be provided with Lightning and over voltage protection, connected with proper earth pits. The main aim of over voltage protection is to reduce the over voltage to a tolerable level before it reaches the PV or other sub-system components. The source of over voltage can be lightning or other atmospheric disturbance.

The lightning Conductors shall be made of 25 mm diameter 4000 mm long GI spike as per provisions of IS 2309-1969. Necessary concrete foundation for holding the lightning conductor in position to be made after giving due consideration to maximum wind speed and maintenance requirement at site in future. The lightning conductor shall be earthed through 20 mm X 3 mm thick GI flat earth pits/earth bus made with 25 mm X 5 mm GI flats.

Earthing Systems:
The Earthing for array and distribution system & Power plant equipment shall be made with GI pipe, 4.5 m long 40 mm diameter including accessories and providing masonry enclosures with cast iron cover plate having locking arrangement, watering pipe using charcoal or coke and salt as required as per provisions of IS:3043. Necessary provision shall be made for bolted isolating joints of each Earthing pit for periodic checking of earth resistance.
Each array structure of the SPV yard shall be grounded properly. The array structures and the lightning conductors are to be connected to earth through 25 mm X 5mm GI strip.

The inverters and battery charger and all equipment inside the control room and battery room to be connected to earth through 25 mm X 5mm tinned copper strip including supplying of material and soldering. As earth bus be provided inside the control room with 25 mm X 5mm tinned copper strip.

In compliance to Rule 61 of Indian Electricity Rules, 2004 (as amended up to date), all non-current carrying metal parts shall be earthed with two separate and distinct earth continuity conductors to an efficient earth electrode.

Tool kits:
Necessary tools kit is to be provided along with the each Power Plant for any routine maintenance or immediate repair.

Display Board:
You shall provide the display board of size 3 ft x 3 ft that gives detailed circuit diagram of the system with its description.

Comprehensive Maintenance Contract (CMC):
The PV module (s), battery bank, Inverter and other sub - components will be warranted as per the given clause. The manufacturers can also provide additional information about the system and conditions of warranty as necessary.

Scope of Operation & Maintenance of SPV Power Plant for a period of 5 years from date of commissioning

Regular maintenance of the SPV Power Plant for a period of 5 years after commissioning along with supply of consumable items.
The breakdown maintenance of the entire system including supply of necessary spare parts if any shall be for a period of 5 years from the date of commissioning of power plant

- 5 years maintenance period shall begin on the date actual commissioning of the power plant.
- Normal and preventive maintenance of the power plant such as topping up of batteries, tightening of all electrical connections, changing of tilt angle of module mounting structure, cleaning & greasing of battery terminals, etc. Shall be covered under CMC.
- During maintenance period of the power plant, if there is any loss or damage of any component of the power plant due to miss management/miss handling or due to any other reasons pertaining to the vender's deputed personnel, what-so-ever, the vender shall be responsible for immediate replacement/rectification. The damaged component may be repaired or replaced by new component. It is understood after examination the performance of the component or the system shall not degrade.

System Detail for 14KWp Grid Interactive Solar PV Power Plant:

Sl. No.	Brief Description	Units	Make
1	SPV modules for a 14 Kwp Grid Interactive Solar PV Power Plant, as per specifications.	1 Set	Compliant to bid document spec's
2	SPV module mounting structure suitable for accommodating 14 KWp capacity SPV modules including foundation as per specifications on rooftop	1 Set	As per BIS
3	PCUs as per specifications	1 Set	SMA / OPS/Schneider/KACO Siemens / ABB / Emerson / equivalent
4	Array Junction Boxes (Optional)	1 Set	Tyco / Hensel/ spelberg / equivalent
5	Main Junction Boxes(optional)	1 Set	Tyco / Hensel/ spelberg / equivalent
6	DC Distribution units as per specifications	1 Set	Siemens / ABB / Schnieder Electric/ L&T / equivalent
7	AC Distribution units as per specifications	1 Set	Siemens / ABB / Schnieder Electric/ L&T / equivalent
8	Cables requirement as per design	Mtrs. As required at site for full plant commissioning	Finolex / Polycab / Havells /equivalent
9	Fire extinguisher in accordance with BIS codes for electrical short circuit fires along with sand buckets	1 Set	
10	Lightning arrester complete set as per specification and Protection device.	2 Sets	BIS compliant
11	Earthing complete set as per specification	2 Sets	BIS compliant
12	Recommended underground /sealed cabling up to distribution control panel		
13	Providing training to engineers and site staff for operating Maintenance and trouble shooting skills, if necessary		

All the items against which no make has been mentioned must confirm to ISI standards and not below REC specifications.

Technical Specifications FOR 14KWp SPV Systems:

The general scope under this contract includes to design, manufacture, testing, inspection, packing and forwarding, transportation up to project site, loading & unloading, storage in safe custody, erection, carrying out preliminary tests at site, commissioning, performance testing, operation and maintenance for 5 years & handing over to all the equipment of SPV Power plant on the respective sites / as per instruction from time to time. The illustrative Schedule of requirements is in accordance with the specifications contained in this document

1. Solar Photovoltaic Modules

1.1 The total solar PV array capacity should not be less than 14 Kwp should comprise of solar crystalline modules of minimum 250 Wp and above wattage. Module capacity less than minimum 250 watts should not be supplied. The module should be of minimum 60 cells modules with three bus lines. The module type must be qualified as per IEC 61215 latest edition for crystalline silicon. SPV module conversion efficiency should be equal to or greater than 14.5% under STC. Modules must qualify to IEC 61730 Part I and II for safety qualification testing. Certificate for module qualification from IEC or equivalent is to be submitted as part of the bid offer. Self-undertaking from manufacturer / supplier that the modules being supplied are as per above is also to be submitted.

1.2 The PV module shall perform satisfactorily in humidity up to 50% with temperature between – 5oC to + 85oC. Since the modules would be used in a high voltage circuit, the high voltage insulation test shall be carried out on each module and a test certificate to that effect provided.

1.3 The predicted electrical degradation at the end of the period of 5 years shall be less than ten (5) per cent of the full rated original output.

1.4 Other general requirement for the PV modules and subsystems shall be the following:

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

b. The rated output power of any supplied module shall have tolerance of +/- 3% as per MNRE standard specs.

c. The peak-power point voltage and the peak-power point current of any supplied module and/or any module string (series connected modules) shall not vary more than 3 (three) per cent from the respective arithmetic means for all modules and/or for all module strings, as the case may be.

d. Except where specified, the front module surface shall consist of impact resistant, low-iron and high-transmission toughened glass.

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

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

g. Necessary I-V curves at 25c, 45c, 60c and at NOC are required to be furnished. Offers to provide PV module warranty of 25 years with more than 20% degradation in performance /output over 25 years.

h. Each PV module used must use RFID inside the lamination and as per MNRE guidelines. The following information must be mentioned in RFID used on each module:
   i) Name of the manufacturer of PV module; name and manufacturer of the solar cell;
   ii) month and year of manufacture;
   iii) I-V curve, wattage, Im, Vm, FF for the module;
   iv) unique serial no & model no;
   v) Date & year of obtaining IEC PV module qualification certificate.

2. Array Structure:

2.1 Wherever required, suitable number of PV panel structures shall be provided.
2.2 Structural material shall be corrosion resistant, galvanized and compatible with the materials used in the module frame, its fasteners, nut and bolts. Galvanizing should meet ASTM A-123 hot dipped galvanizing or equivalent which provides at least spraying thickness of 70 microns on steel as per IS5905, if steel frame is used. Structures shall be supplied complete with all members to be compatible for allowing easy installation at the rooftop site.

2.3 The structures shall be designed to allow easy replacement of any module & can be either designed to transfer point loads on the roof top or UDL as per site conditions.

2.4 structures may be of fixed tilt or manual single axis variable tilt.

2.5 Each panel frame structure shall be so fabricated as to be fixed on the rooftop column/wall structures. The structure should be capable of withstanding a wind load of 200 km/hr after grouting & installation. The front end of the solar array must be at least 0.5 meter above the rooftop. Grouting material for SPV structure shall be as per M15(1:2:4) concrete specification. However, it is advisable to install the structures without roof penetration. Only hard brushing may be allowed based on actual condition of roof.

2.6 The structures shall be designed for simple mechanical and electrical installation. There shall be no requirement of welding or complex machinery at the installation site. If prior civil work or support platform is absolutely essential to install the structures, the supplier shall clearly and unambiguously communicate such requirements along with their specifications in the bid. Detailed engineering drawings and instructions for such prior civil work shall be carried out prior to the supply of Goods.

2.7 The supplier shall specify installation details of the PV modules and the support structures 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 rooftop columns properly. All nuts and bolts shall be of very good quality stainless steel.

3. Power Conditioning Unit (PCU):

The PCUs required shall be of minimum 14 KWp DC/ 5 KVA AC rated capacity. The PCU with grid interactive feature shall feed power to the captive load of the building. The Power Conditioning Unit (PCU) being grid interactive in nature shall consist of multiple MPPT controllers. It shall provide necessary features for Grid Synchronization and Data Logging/Monitoring. The PCU should convert DC power produced by SPV modules in to AC power and must synchronize automatically its AC output to the exact AC Voltage and frequency of Grid. The bidder may choose the inverter as string/Central as per their Design/ Project Philosophy.

Common Technical Specification:

Sl no	Particulars	Specification
1	Output voltage:	3 phase, 415 V ac (+/- 20 %)
2	Frequency	50 Hz (with tolerance limit of 46Hz - 54Hz)
3	MPP Voltage range	250V - 800V DC
4	Nominal Power	14 kVA
5	Maximum DC capacity of PCU	14kW
6	Standard conformation	IEC 61683
7	Total Harmonic Distortion	Less than 3%
8	Operating temperature Range	25 to 60 Degree C
9	Housing cabinet	PCU to be housed in suitable switch cabinet, Within IP 65 degree of ingress protection
5	PCU efficiency	98 % and above at full load,
11	Power Control	MPPT
12	Number of MPPT	Minimum 2 with possibilty of both symmetric & asymmetric string design
13	The DC energy produced has to be utilized to maximum and supplied to the bus for inverting to AC voltage to extract maximum energy from solar array and provides	3-ph, 415V AC/ (+20% to – 20%), 50 (56Hz - 54Hz) with total harmonic voltage distortion less than 3% to synchronize with local grid . DC voltage ripple content shall be not more than 3%.
14	The PCU shall be of very high quality	Efficiency not less than 98% and shall be capable of running in integrated mode.
15	Degree of protection	PCU shall be IP-54.
16	Data logging	Built in with data logging to remotely monitor plant performance shall be provided so that performance can be monitored through web
17	The PCU shall be designed for continuous, reliable power supply as per specification	
18	The PCU should be designed to be completely compatible with the SPV array voltage and Grid supply voltage.	
19	PCU shall operate in sleeping mode when there will no power connected	
20	Protections:	
21	Over voltage both at input & output.	

22	Over current both at input & output.	
23	Over/under grid frequency.	
24	Short circuit.	
25	Anti- Islanding Protection	
26	It should have user friendly 4X40 LED/LCD display for programming and view	
27	Cooling – Natural Air Cooling/ Temperature driven fans	

The inverter should meet IEC 60068 (1, 2, 14, 30) specification.

3.1 Factory Testing:

a. Necessary factory test documents and certificates are to be provided against the above mentioned features.

3.2 Plant Metering / Data Logging

a) PV array energy production: The actual value of AC/DC Voltage, Current & Energy generated by the PV system shall have to be provided. Two way LT 415V energy meter (Import - Export metering) shall be incorporated in the system on the main LT AC Grid supply.

b) Solar Irradiance An integrating pyranometer (Class II or better) should be provided with the sensor mounted in the plane of the array. Readout should be integrated with data logging system.

c) Wind Speed : An integrated wind speed measurement unit be provided.

d) Temperature Sensor: Integrated temp, sensors for measuring the module surface temp., invertor inside enclosure temp, and ambient temp to be provided complete with readouts integrated with the data logging system.

e) GSM Modem / Wi Fi modem in case GSM connectivity is used or Wireless Router + modem in case Ethernet connection is being used for remote access must be provided.

g) Remote Supervisory Control and data acquisition through SCADA software at the purchasers location 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.

4. Array Junction Box, Main Junction Boxes (Optional):

The junction boxes are to be provided in the PV yard for termination of connecting cables. The J. Boxes shall be made of FRP/Powder Coated Aluminium with full dust, water & vermin proof arrangement. All wires/cables must be terminated through cable lugs. The J.Bs shall be such that input & output termination can be made through suitable cable glands. Copper bus bars/terminal blocks should be housed in the junction box with suitable termination threads Conforming to IP65 standards. The JB must have suitable capacity SPD device to protect the system from surge.

5. DC Distribution Board :

DC Distribution panel may be required to receive the DC output from the array field with analog measurement meter for voltage, current and power from different MJBs so as to check any failure in the array field. DC DPBs shall have sheet from enclosure of dust & vermin proof. The bus bars are to be made of copper of desired size. Suitable capacity MCBs be provided for controlling the DC power output to the PCU along with necessary surge arrestors.

Requirement/specifications of DCDB may be changed as per site conditions.

6. AC Distribution Panel Board:

6.1 AC Distribution Panel Board (DPB) shall control the AC power from PCU, and should have necessary surge arrestors. Interconnection from ACDB to mains at LT Bus bar to be carried out and complete equipment along with metering to be installed in the ACDB.

Requirement/specifications of ACDB may be changed as per site conditions. An ACDB is to be provided at the cable terminating point emanating from PCU for interconnection control of dedicated electrical loads.

6.2 All switches at the, circuit breakers, connectors should confirm to IEC 60947, part I, II and III.

7. Cable & Wiress

7.1 Solar Cables: Solar array connecting cables should be 1.8 KV grade double insulated UV protected cables

7.2 DC Cables: Only FR copper cables (PVC flexible/armoured wherever required) of appropriate size and of reputed make shall have to be used.

7.3 AC Cables: Copper/Aluminium XLPE armoured/non armoured cables should be used.

7.4 Cables Ends: All connections are to be made through suitable cable/lug/terminals; crimped properly & with use of Cable Glands.

7.5 Cable Marking: All cable/wires are to be marked in proper manner by good quality ferule or by other means so that the cable can be easily identified. Any change in cabling schedule/sizes if desired by the bidder/supplier be got approved after citing appropriate reasons, All cable schedules/layout drawings have to be got approved prior to installation. All cable tests and measurement methods should confirm to IEC 60189.

7.6 Cable Routing: All outside cables must be armoured and inside cables must be routed through proper conduits. Inside cables may be flexible. Solar array field cables must be routed through proper conduits.

7.7 General cable specifications:

· Multi strand, annealed high conductivity copper conductor
· PVC type ‘A’ pressure extruded insulation
· Overall PVC insulation for UV protection and confirm to IEC 69947
· Armoured cable for underground/outdoor laying
· All cables shall conform to BIS standards (IS 694) and (IS 1554)
· The size of each type of cable selected shall be based on minimum voltage drop, however, the maximum drop shall be limited to 2%
· Selected cable should carry a current density of minimum 1.2Amp/Sq.mm
· All electrical cables / wires inside the building to be fixed in accordance with specifications for electrical works.
· Proper lying of cables have to be ensured in appropriate cable trays, pipes / trenches as per site requirement.
· A.C. supply cables to be terminated at the DB / LT bus bar.
· For laying / termination of cables, latest BIS / lEC codes / standards are followed.

8. Fire Extinguishers:

The fire fighting system for the proposed power plant for fire protection shall be consisting of:

· Portable ABC type fire extinguishers in the control room for fire caused by electrical short circuits.
· Sand buckets in the control room

The installation of Fire Extinguishers should confirm to TAC regulations and BIS standards. The fire extinguishers shall be provided in the control room housing the batteries and PCUs as well as on the roof top where the PV arrays have been installed.

9. Lightning Protection:

There shall be the required number of suitable lightning arrestors installed in the array field. Lightning protection shall be provided by the use of metal oxide varistors and suitable earthing such that induced transients find an alternate route to earth. Protection shall meet the safety rules as per Indian Electricity Act

5. Earthing Protection

Each array structure of the PV yard should be grounded properly. In addition the lighting arrester/masts should also be provided inside the array field. Provision should be kept be provided inside the array field. Provision should be kept for shorting and grounding of the PV array at the time of maintenance work. All metal casing/shielding of the plant should be thoroughly grounded in accordance with Indian electricity Act./IE Rules. Earth resistance should be tested in presence of the representative of OREDA after earthing by calibrated earth tester. PCU ACDB & DCDB should be earthed properly.

11. Tools, Tackles & Spares:

After completion of installation & commissioning of the power plant, necessary tools & tackles are to be provided free of cost by the contractor for maintenance purpose. List of tools and tackles to be supplied by the contractor for approval of specifications and make from OREDA.

12. Danger Boards

Danger boards should be provided as and where necessary as per IE Act./IE rules as amended up to date.

13. Drawings & Manuals

2 copies of Engineering, electrical drawings and Installation and O&M manuals are to be supplied. Bidders shall provide complete technical data sheets for each equipment giving details of the specifications along with make/makes in their bid along with basic design of the power plant and power evacuation, synchronization and distribution for street lighting system along with protection equipment. Approved ISI and reputed makes for equipment be used. For complete electro-mechanical works, bidders shall supply complete design, details and drawings for approval to OREDA before progressing with the installation work.

13. Electrical Inspectorate Approval:

The bidder is required to take State Electrical Inspectorate Approval before synchronization with grid. The necessary documentation and expenses will be under bidder’s scope. Site handover will be considered only after receiving of electrical inspectorate approval. However, OREDA may facilitate the bidder as and whenever required to make the process faster.

PRICE BID for 10KWp

Sl. No.	Item	Rate per system
1	SPV modules for a total capacity of 10KWp Off-Grid Solar PV Power Plantas per specifications.	
2	SPV module roof top mounting structure suitable for accommodating 10 Kwp capacity SPV modules including foundation as per specifications on rooftop	
3	PCUs as per specifications for 10 Kwp grid interactive having net metering features	
4	Battery Bank of 120V 700AH	
5	Array Junction Boxes (optional)	
6	Main Junction Boxes (optional)	
7	DC Distribution units as per specifications	
8	AC Distribution units as per specifications	
9	Cables requirement as per design	
5	Fire extinguisher in accordance with BIS codes for electrical short circuit fires along with sand buckets	
11	Lightning arrester complete set as per specification	
12	Earthing complete set as per specification	
13	Spares, tools and plant for 5 years warranty operation & maintenance and 5 years CMC	
14	Fuses, Transfer switches, Printed Circuit boards required for power plant	
15	Providing training to engineers and site staff for operating Maintenance and trouble shooting skills	
16	Engineering, electrical drawings and installations and O&M manuals	
17	Taxes and duties as per OVAT bill to be raised	

	mandatory as per FD, GOO.	
18	Total (16+17)	
19	Installation and commissioning	
20	Taxes and duties	
21	Sub Total (19+20)	
22	CMC for 5 years @	
23	Taxes and duties	
24	Sub Total (22+23)	
	Grand Total (19+22+25)	

Signature of the Bidder with seal

PRICE BID for 14KWp

Sl. No.	**Item**	**Rate per system**
1	SPV modules for a total capacity of 14KWp Grid Interactive Solar PV Power Plant as per specifications.	
2	SPV module roof top mounting structure suitable for accommodating 14 Kwp capacity SPV modules including foundation as per specifications on rooftop	
3	PCUs as per specifications for 15 Kwp grid interactive having net metering features	
4	Array Junction Boxes (optional)	
5	Main Junction Boxes (optional)	
6	Data Logging system with remote monitoring as per specification	
7	DC Distribution units as per specifications	
8	AC Distribution units as per specifications	
9	Cables requirement as per design	

5	Fire extinguisher in accordance with BIS codes for electrical short circuit fires along with sand buckets	
11	Lightning arrester complete set as per specification	
12	Earthing complete set as per specification	
13	Spares, tools and plant for 5 years warranty operation & maintenance and 5 years CMC	
14	Fuses, Transfer switches, Printed Circuit boards required for power plant	
15	Providing training to engineers and site staff for operating Maintenance and trouble shooting skills	
16	Engineering, electrical drawings and installations and O&M manuals	
17	Taxes and duties as per OVAT bill to be raised mandatory as per FD, GOO(Annexure-D)	
18	Total (16+17)	
19	Installation and commissioning	
20	Taxes and duties	
21	Sub Total (19+20)	
22	CMC for 5 years @	
23	Taxes and duties	
24	Sub Total (22+23)	
	Grand Total (19+22+25)	

Signature of the Bidder with seal

Eligibility Criteria.

The bidding concern must fulfil all the following criteria for techno-commercial qualification of the tender.

2.10 Bids must be submitted in English language only.

- The bidder should be of MNRE valid channel partner and be a Solar PV manufacturer / system integrator with valid products tested and qualified by any of the authorized test centres as per MNRE guidelines or with NSIC certification on production of Solar PV Systems.

2.11 The farm must have OVAT/ TIN/ Sales tax clearance certificate and must be paid VAT returns of last two quarters.

2.12 The bidder firm must have a minimum annual turnover of Rs 3.00 crore over last three years exclusively in the business of solar PV alone in the state of ODISHA. Bidders shall not have incurred losses during any of the last three years.

2.13 The firm must have designed, manufactured, tested supplied, erected, commissioned minimum 200 KWp (cumulative) in govt / PSUs/ govt agency/ bodies in the state of ODISHA and which are in successful operation on the date of bid opening.

2.14 The firm must have been electrified minimum 100 Villages under RVEP program in ODISHA.

2.15 The farm must not have been debarred / blacklisted by any Govt. Dept, agency, PSUs / institution / agencies / autonomous organizations.

2.16 The Firm must have NSIC registered and Micro and Small Enterprises (MSEs) registered in ODISHA circle.

2.17 The firm must be having the service centre in the locality with skilled technical team.

Technical Parameters

PV Module Qualification

The PV modules used in the solar power projects must qualify to the latest edition of any of the following IEC PV module qualification test or equivalent BIS standards.

Crystalline Silicon Solar Cell Modules: IEC 61215

PV modules must qualify to IEC 61730 for safety qualification testing. For the PV modules to be used in a highly corrosive atmosphere throughout their lifetime.

PCU/ INVERTER

- The PCU should be designed to be completely compatible with the SPV array voltage.
- The combined kVA rating of all PCUs shall not be less than corresponding KVA at standard temperature.
- Optimum numbers of central inverter with MPPT shall be used with the power plant for maximum efficiency and shall be efficient based on PWM MPPT with IGBT/ reliable power based design.
- The sine wave output of the inverter shall be 415V, 3 phase, 4 wire 50 HZ AC LT voltage.
- The peak inverter efficiency inclusive of built in isolation transformer shall exceed 85% at full load
- Inverter shall provide 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 be possible.
- Operating temperature Range shall be 0 to 55 deg C
- Maximum Power Point Tracker (MPPT) shall be integrated in the power conditioner unit to maximize energy drawn from the Solar PV array.
- The charge controller/ MPPT units should qualify to IEC standards.
- Online microprocessor based Data Acquisition Systems and Remote Monitoring facility for 365 days with data Recovery from remote location should equip.

- Provision for Dual Energy Metering option should be there in the systems.
- Firm should have sufficient enclosure on report preparation and should provide energy generation report on demand of officials.

DATA ACQUISITION SYSTEM

- Data Acquisition System shall be provided with solar PV plant.
  2. Computerize DC String/Array monitoring and AC output monitoring hall be provided as part of the inverter and/or string/array combiner box or separately.
- 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.
- 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)
- 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. 2 years.
- Computerized AC energy monitoring shall be in addition to the digital AC energy meter.
- The data 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.

- All instantaneous data shall be shown on the computer screen.
- Software shall be provided for USB download and analysis of DC and AC parametric data for individual plant.
- Provision for Internet monitoring and download of data shall be also incorporated.

The following parameters shall be measured, displayed and recorded/logged. Daily plotting of graphs for various parameters shall also be available on demand.

- 15 minute, Daily, monthly & Annual energy generated by the solar system (kWh)
- Solar system temperature
- Ambient temperature
- Solar irradiation/isolation
- AC and DC side voltage and currents
- Power factor on AC side
- DC injection .
- Total Current Harmonics distortion in the AC side
- Total Voltage Harmonic distortion in AC side
- Efficiency of the inverter
- Solar system efficiency
- Display of I-V curve of the solar system
- Any other parameter considered necessary by supplier of the solar PV System based on prudent practice

SOLAR RADIATION AND ENVIRONMENT MONITORING SYSTEM

- Computerized solar radiation and environment monitoring system shall be installed on one of the buildings along with the solar PV power plant. The system shall consist of various sensors, signal conditioning, data acquisition, LCD display and remote monitoring.