

CALL FOR EMPANELLMENT OF VENDORS

FOR

**Supply, Installation and Commissioning of
Grid Interactive Rooftop Solar PV Power Plants
And Extending Maintenance Services
Directly to Customers**

Under

**Off-grid and Decentralized Solar Application under
JNNSM, MNRE, GOI**



ISSUED BY

ODISHA RENEWABLE ENERGY DEVELOPMENT AGENCY

S-59, MIE, BHUBANESWAR-751010

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Website: www.oredaorissa.com

No. 1798 /OREDA

Dated.23.04.2016

CALL FOR EMPANELMENT

Applications in sealed envelopes are invited from interested manufacturers / system integrators of solar PV systems in the country having valid test certificates from MNRE accredited test centres for Supply Installation, Commissioning and 5 years Comprehensive Maintenance of Rooftop Solar PV Power Plants of capacities ranging between 1 to 100 kWp directly to customers under the Off-grid and Decentralised Solar Applications of MNRE, GOI.

The last date of receipt of application and other documents in prescribed format is 16.5.2016

For details please visit our web site www.oredaorissa.com.

Sd/-
Chief Executive

Memo No. 1799/OREDA

Dt. 23.04.2016.

Copy forwarded to the Additional Secretary to Govt, Science and Technology Dept., Govt of Odisha, Bhubaneswar for information and necessary action.

Sd/-
Chief Executive

Memo No.1800/OREDA

Dt.23.04.2016

Copy forwarded to the PSO & Head, Regional Office(ER), MNRE, Govt. of India, Plot No.N-2/176, Ground Floor, I R C village, Nayapalli, Bhubaneswar-751 015 for favour of information and necessary action.

Sd/-
Chief Executive

Memo No .1801(6)/ OREDA

Dt.23.04.2016

Copy to Director (Admn), OREDA for information and necessary action . The Tender call notice may be published in the “Daily Samaj”, “The Indian Trade Journal” and all editions of “The Indian Express”

Copy to all divisional heads of OREDA for information and wide circulation.

Copy to Notice Board / website, OREDA for circulation.

Sd/-

Chief Executive

DETAILS OF EMPANELMENT NOTICE

Notice NO.1798/OREDA, dt.23.04.2016.

Applications in sealed envelopes are invited from interested manufacturers / system integrators of solar PV systems in the country having valid test certificates from MNRE accredited test centres for Supply Installation, Commissioning and 5 years Comprehensive Maintenance of Rooftop Solar PV Power Plants of capacities ranging between 1 to 100 kWp directly to customers under the Off-grid and Decentralised Solar Applications of MNRE, GOI.

S/N	Particulars	Place of installation	Capacity (kWp)	Fees (INR)
1	Supply, installation, commissioning and maintenance for a period of 5 years of grid interactive Solar PV power plant of different capacities ranging from 1 to 100 Kwp directly to intending customers in the state of Odisha as per the MNRE Product and Service Guidelines under off-grid and decentralised solar application of MNRE, GOI.	Any location in the state of Odisha	1 to 100 Kwp	Application Fees: Rs.10,500/- Empanelment Fees: Rs. 5,00,000/- (On Successful Empanelment only) .

Document for empanelment can be had from OREDA, S-3-59, Mancheswar Industrial Estate, Bhubaneswar-10 on all working days in between 11.00 A.M. to 4.00 P.M. till 13.5.2016 on payment of Rs. 10,500/- (Rupees Ten Thousand Five Hundred) only. Payment can be made in cash at OREDA cash counter or through Account Payee Demand Draft in favour of Chief Executive, OREDA Payable at Bhubaneswar. The documents can also be downloaded from OREDA Website. In case of downloaded documents the application fee may be paid in shape of Demand Draft drawn on any Nationalised bank in favour of Chief Executive, OREDA payable at Bhubaneswar. The Application Fees in shape of Demand draft has to be submitted along with the Application only.

Application will be received up to **3.00 P.M of 16.5.2016** and **will be opened on the same day at 3.30 P.M** in presence of the applicants or their authorized representatives. sd/-

Chief Executive

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Disclaimer

Kindly Note:

1. This document is not transferable
2. Though adequate care has been taken for preparation of this document, the applicant 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 applicant within ten days from the date of issue of this notice, it shall be considered that 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 application process.
4. While the document 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 document, even if any loss or damage is caused by any act or omission on their part.

OREDA

Telefax: (0674) 2580554, 2586368

Email: ceoreda@oredaorissa.com

Background:

This call for empanelment is invited as compliance of the following missions, policies and guidelines issued or to be issued by Govt of India, Govt of Odisha and Regulatory Commissions for promotion, propagation and development of renewable energy.

1. Off Grid and Decentralized Solar Application under JNNSM,MNRE, Govt of India
2. Renewable Energy Policy, Govt of Odisha
3. Net Metering Regulations and its subsequent amendments issued by OERC from time to time
4. Climate Change Action Plan, Govt of Odisha

The state Odisha with an average solar radiation of about 5 kWh per sqm, highest domestic tariff of Rs. 5.60 per unit and over 7 million urban population has tremendous potential for harnessing solar power on rooftops in the grid-tied mode. The Odisha Electricity Regulatory Commission has already pronounced the Net Metering Regulation to facilitate installation of such plants.

In the wake of the above and also in view of the targets set by the Ministry of New and Renewable Energy for harnessing 2.377GW solar power in the state, OREDA intends to promote installation of rooftop solar power plants in a big way.

Since rooftop solar power plants will be installed mostly for individual households and institutions it has tremendous potential to influence public opinion about the performance and usefulness of such projects. Hence quality of materials, proper workmanship, timely execution, delivery of post installation services etc. are considered to be of paramount importance.

In order to take this challenging task forward OREDA intends to form a technically & financially strong and dedicated team of project executors by empanelling reputed system integrators of solar PV power plants within the country.

In this endeavor OREDA also intends to provide a wide range of choice to the customers by offering various combinations of solar PV panels, Inverters, net meters, structures, SPDs and other protection devices etc. as well as post installation services to the customers at competitive prices.

OREDA has already launched a customer interface website - www.odisharenewable.in where the customer after determining the capacity of the power plant she/he is eligible for (subject to the limitations provided in the regulations, available roof space, transformer capacity etc.) will have the choice to select any one of the empanelled vendors after viewing their products, services, costs, company profile etc. and place the order. Once selected the vendor will receive a message for a personal interview, site assessment and proceeding further with the execution of the project.

OREDA also intends to remotely monitor all the installed systems on a single dashboard for which the empanelled vendors will have to cooperate and agree to share their remote monitoring protocols with OREDA. For this purpose the vendor may have to obtain prior permission from the OEMs of their CPUs.

Important Dates

S/N	Event	Date	Time
1	Commencement of Sale of Applications	30.04.2016	11.00 AM
2	Last date for Sale of Applications	13.05.2016	4.00 PM
3	Pre empanelment discussions	05.05.2016	11.00 AM
4	Last date for submission of applications	16.05.2016	3.00 PM
5	Date of opening of applications	16.05.2016	4.00P.M.

Check list of Documents to be submitted along with the Application

S/N	Particulars	Complied	Page-no / Flag
1	Bank draft for Rs.10,500/- or original money receipt issued by OREDA as proof of purchase of application form	Bank No Dt	Envelope
3	Forwarding letter duly signed and stamped by the bidder		
4	Undertaking duly signed and stamped by the bidder. Undertaking to unconditionally accept all terms and conditions laid in for empanelment with copy of Board Resolution		
5	Valid document registering the status of the bidder as manufacturer /systems integrator		
6	Organizational profile containing the original documents defining the constitution or legal status, place of registration / branches, annual off-grid and on-grid wise capacity of solar power plants installed for last 3 years.		
6	Copy of the PAN card of the bidder's firm		
7	Copy of the TIN card of the bidder's firm		
8	Copies of Tax returns, VAT/ e-filing		
9	Document stating no loss certificate duly signed and stamped by a registered chartered accountant on the letter head of the chartered accountant		
10	Declaration /Original Board resolution to undertake the work under the jurisdiction of the local office, if qualified		
11	Valid Test reports of components of solar power plant from MNRE accredited test lab		
12	Willingness to open service centre in the state of Odisha and Local registered office for total execution		
13	Undertaking for Indigenoussness of the supplied items		
14	Filled in application form along with copy of the document duly signed and stamped at the bottom of each page.		

1. Eligibility Criteria

In order to be eligible to be empanelled, the vendor must fulfil the following eligibility criteria.

- a) The vendor must be a company registered under the Indian Companies Act 1956 or a firm registered under VAT / CST.
- b) Companies/Firms applying from outside Odisha **must register themselves under O-VAT within a month from the date of their provisional empanelment.**
- c) The company/firm must be an integrator of solar PV power plants of capacities ranging between 1 KW to 100 KW.
- d) The cumulative capacity for integrating solar PV power plants should be minimum 500 KW per annum. **This must be reflected in the stores details certified by NSIC, OSIC, DIC, and such other certifying organizations.**
- e) The vendor must provide details of the OEMs of all major components such as solar PV module, battery, charge controller, PCU etc. along with their latest test certificates (not older than 6 months from the date of submission application) from any of the MNRE approved test laboratories.
- f) The company/firm must have been rated by any of the approved rating agencies of MNRE like ICRA, CRISIL etc. for SPV systems and must be holding necessary certificate to that effect.
- g) The company/firm must have established quality assurance system and organization in line with the requirements under this call for empanelment.
- h) Following empanelment, the vendor must open service centres adequately equipped with technical personnel, spares, tools and tackles etc. to provide proper timely (48 Hrs of response time) maintenance services to the installed systems.
- i) The vendor must not have been debarred / blacklisted / defaulted by any Govt. Dept, agency, PSUs / institution / agencies / autonomous organizations. As proof of the same the vendor shall submit duly notarized a self-certificate by an authorized person of the bidder's company/firm.
- j) The applicant shall submit an affidavit towards the submission of above documents in support of authenticity of documents.

2. Scope of the work

The broad scope of the work includes supply, installation, commissioning, testing and maintenance (for 5 years) of solar PV power plants of different capacities ranging from 1 KW to 100 KW. The vendor is free to extend his scope of work to proactively deal with individual customers to augment his own business interest.

Specific requirements under these scopes are

- a. Subject to shortlisting/ selection of the vendor by a customer, the representative of vendor must visit the customer as per the convenience of the latter and explain the customers about different aspects of the project.
- b. During the visit the vendor in consultation with the customer should undertake a site assessment for installation of the power plant, grounding, connectivity etc.
- c. After receipt of a written consent from the customer the vendor may collect advance amount as may be mutually agreed between him and the customer and undertake the following activities on behalf of the customer
 - Process his/her application for loan if it is not a self-finance case.
 - Submit application to the concerned DISCOM and obtain NOC
 - Subject to obtaining of the NOC submit an application to the DISCOM for approving the connectivity drawing and providing a net meter or certifying the net meter to be provided by the PE.
- d. Subject to sanction of the loan and obtaining of the NOC, Net Meter etc. the vendor in consultation with the customer should decide a date for supply of materials.
- e. Supplying all materials as per the BOQ and install the power plant.
- f. Commission the project and test the same in the presence of the customer, representative of OREDA and the DISCOM and obtaining necessary commissioning certificate.
- g. Collection of all documents, including GPS tagged photograph showing the PV array, with the customer in the inset.

- h. Hang /affix the “Solar Home” logo (design to be provided by OREDA) in a prominent place (main gate, facade etc.) and take a picture of the same with the owner of the power plant.
- i. Collect and Compile the Customer’s Information and hand it over to the CRM Dept of OREDA for assignment of Customer ID and building up of Master Consumer Database.
- j. Submit the Joint Commissioning Report to OREDA for consideration of subsidy
- k. Extend both periodic and on call maintenance services through the CRC of OREDA as detailed elsewhere in this document.
- l. Open service Centre/keeping servicing personnel and making available all essential spares in the vicinity of the solar systems.
- m. Submission of periodic reports and returns as per the MIS prescribed by OREDA from time to time.
- n. Getting the drawing of the module mounting structure with double axis manual tracking arrangement approved by OREDA before commencement of work.

3. Instructions to Applicant:

Intending vendors are requested to carefully study the instructions contained hereunder before submission of their applications..

- a. A vendor shall submit a single application only.
- b. The application must be submitted in the prescribed format only.
- c. All other relevant documents as asked for must be given as annexures to the applications
- d. The application along with all annexures must be submitted in a **single hard bound book form** duly page numbered and indexed. **No loose or separate papers or spiral bound documents will be accepted. Submission of loose papers or spiral bound documents shall lead to the rejection of the same.**
- e. Demand Drafts towards cost of document should be submitted in a separate envelop.
- f. Applications must be submitted in English language only.

- g. Incomplete, telegraphic or conditional applications shall not be accepted.
- h. Applicant must sign at the bottom of each page of the documents at the time of submission in token of unconditional acceptance of the departmental terms and conditions, technical specifications etc.
- i. Valid TIN / VAT / CST / E-filing submission document duly attested must be submitted.
- j. Deviations in terms and conditions, Specification of material, Inspection clause etc. will not be accepted under any condition.
- k. The vendor shall submit copies of documents defining the constitution or legal status, place of registration and principle place of business of company or firm.
- l. The vendor shall furnish a brief write up backed with adequate data, explaining 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.
- m. Applications received late due to postal delay or otherwise **will not be considered**.
- n. Certificate to the effect that the systems to be supplied are indigenous & not fully imported must be furnished.
- o. Power of attorney to sign the agreement on behalf of applicant & partnership deed articles, if any, should be enclosed along with original documents.
- p. All pages of the documents must be signed & sealed by the authorized person on behalf of the vendor.
- q. **A pre -empanelment discussion will be held on 5.5.2016 at 11.00 A.M. in the conference hall of OREDA. After discussion, deliberation and written statement / suggestions of the representatives, the final document will be uploaded on the website replacing the previous one.**
- r. The last date of receipt of the applications is 16.5.2016 up to 3.00 PM. sealed offers **(revised and final)** shall only be dropped in the specified box kept in the conference hall of OREDA during office hours on working days.
- s. The applications will be opened on 16.5.2016 at 4.00 PM in the OREDA office, Bhubaneswar in presence of the vendors or their authorized representatives, who may like to be present at the time of opening.
- t. Deviation of any terms and conditions and technical specification shall not be entertained under any circumstances.

4. Acceptance/ Rejection of applications :

Chief Executive, OREDA reserves the right to reject or accept any of the applications or annul the entire empanelment process at any time prior to empanelment without having prejudice of incurring any liability to the affected applicants or any obligation to inform the applicants.

Chief Executive

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

Signature of applicant with Seal

5. Programme Execution Schedule

The program execution schedule will be mutually decided between the user and the vendor.

6. Quality Check and Inspection

- a. All tests and inspections shall be made at the place of delivery. OREDA Officer 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.
- b. OREDA has the right to have the tests carried out at its own cost by an independent agency at any point of time. Pre- delivery inspection at the factory site if necessary will be carried out by OREDA.
- c. Upon intimation about commissioning of a systems by the vendor/user an inspection will be carried out by OREDA essentially to ascertain compliance to the technical specifications and other TOR as specified in this document.
- d. Following such inspection a commissioning report shall be brought out in the prescribed format, which shall form a part of the documents for release of applicable subsidy.

7. Warranty

The SPV Modules and the Balance of Systems (BOS) should be warranted against any manufacturing defect or bad workmanship for a period of 10 (Ten) and 5 (five) years respectively from the date of commissioning of the systems.

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 the concerned customer. The warranty period shall be extended by the period during which the systems remain non-operative due to reasons within the control of the executants. Care should be necessarily taken to make the system operational within a week of reporting of defect.

8. Payment

The cost of the system including that of 5 years maintenance shall be paid to the vendor by the concerned customer only. The mode of the payment is to be mutually decided between the customer and the vendor.

9. 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..

10. Limitation of Liability

The role of OREDA in this empanelment process is to create a platform for the customers and vendors to meet and negotiate with each other for the best deal. The role of OREDA is limited to protecting the customers interest in terms of Product and Post installation Service quality. The transaction between the customer and vendor is exclusive and will be governed by the **Sales of Goods Act and Consumer Protection Act**. In no case OREDA can be made a party to deficiencies of either parties. Only when OREDA observes that the agreed transaction between the Customer and Vendor is closed, OREDA will release the Subsidy (If eligible or available)

OREDA, will, in no case be a party to any dispute or 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.

11. 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 Orissa High court only. The Chief Executive, OREDA reserves the right to accept or reject any or all bids without assigning any reason thereof.

12. Arbitration between Customer and Vendor:

As the enforcer of the MNRE guideline OREDA undertakes the responsibility to protect the customers' interest to the extent of his agreement with the Vendor. Release of subsidy within a reasonable period of time is largely dependent upon the successful performance of the installed system. If OREDA at any point of time realises that the customer has been short changed/harassed by the vendor during the course of execution / maintenance of the project it reserve the right to Suspend/Deregister/Blacklist the vendor.

Chief Executive

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

SIGNATURE OF BIDDER WITH SEAL

Specification of Product and Service

A. Service Procedures and Standard:

- The customer upon installation and commissioning will be given a unique customer id generated from the CRMS database of OREDA.
- The vendor while activating the installation is mandated to familiarise the customer with the Service request Protocol of OREDA (Toll Free Number, Procedure and Follow up Procedure)
- The vendor will conspicuously display the Toll Free number of the OREDA CRC and the Customer ID on the hardware itself and on the operation manual.
- The vendor through this empanelment agrees to serve the customer throughout the economic life of the hardware and an AMC of 5 years as per the MNRE guideline. The terms of AMC in terms of repair and maintenance is enclosed.
- The vendor has to encourage the customer for insurance coverage of the component of service not covered under AMC.
- The CRMS as per the policy will track individual service request of the customers and it reasonably expected to provide solution within 48 hours of such logging. Non adherence to the standard of service will be treated as a non-compliance and repeated non compliances may attract action like suspension and blacklisting of the vendor.

B. Technical Specifications

The general scope under this contract includes 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:

S/ N	Brief Description	Units	Make
1	SPV modules as per specifications.	1 Set	Compliant to spec's
2	SPV module mounting structure suitable for accommodating capacity SPV modules including foundation as	1 Set	As per IEC / BIS

	per specifications on rooftop		
3	PCUs as per specifications	As per spec	SMA / OPS/Schneider/KACO Siemens / ABB / Emerson / Refusol / Delta /equivalent
4	Array Junction Boxes	1 Set	Tyco / Hensel/ spelberg / equivalent
5	Main Junction Boxes	1 Set	Tyco / Hensel/ spelberg / equivalent
6	Data Logging system with remote monitoring as per specification	1 Set	system as per specifications
7	DC Distribution units as per specifications	1 Set	Siemens / ABB / Schnieder Electric/ L&T / equivalent
8	AC Distribution units as per specifications	1 Set	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
10	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	1 Set	As per BIS compliant
12	Earthing complete set as per specification	1 Set	As per BIS compliant
13	Spares, tools and plant for 5 years operation and maintenance	As per list	
14	Fuses, Transfer switches, Printed Circuit boards required for power plant	1 Set	
15	Providing training to customers for operating Maintenance and trouble shooting skills		
16	Operation and maintenance of the		

	SPV Power Plant for a period of 5 years from date of commissioning of the power plant.		
17	Engineering, electrical drawings and installations and O&M manuals	1 Sets	
18	Any other equipment required to complete the installation		

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

C. Product Specifications

1. Specification of Solar PV Modules

Solar PV modules shall be of the crystalline silicon type, manufactured in India. Detailed specifications of the solar PV modules are given below:

<i>Type</i>	Crystalline silicon
<i>Origin</i>	Manufactured in India
<i>Efficiency</i>	>13%
<i>Fill factor</i>	>70%
<i>Degradation</i>	>=90% of design nominal power after 10 years.
<i>Warranty</i>	>=80% of design nominal power after 20 years.
<i>Module frame</i>	Non-corrosive and electrolytic compatible with the mounting structure material.
<i>Termination box</i>	Thermo-plastic, IP 65, UV resistant
<i>Blocking diodes</i>	Schottky type
<i>Module minimum rated power</i>	The nominal power of a single PV module shall not be less than 74Wp.

<p><i>RF Identification tag for each solar Module</i></p>	<p>Yes. Must be able to withstand environmental conditions and last the life of the solar module and shall be kept inside the module.</p> <p>As per guidelines issued for off-grid and decentralized applications programme under JNNSM, the RFID tag must be inside of the module .</p>
<p><i>RF Identification tag Data</i></p>	<p>a) Name of the manufacturer of PV Module b) Name of the Manufacturer of Solar cells c) Month and year of the manufacture (separately for solar cells and module) d) Country of origin (separately for solar cells and module) e) I-V curve for the module f) W_m, I_m, V_m and FF for the module g) Unique Serial No and Model No of the Module h) Date and year of obtaining IEC PV module qualification certificate i) Name of the test lab issuing IEC certificate j) Other relevant information on traceability of solar cells and module as per ISO 9000</p>
<p><i>Power output rating</i></p>	<p>To be given for standard test conditions (STC). I_V curve of the sample module should be submitted.</p>
<p><i>Compliance with standards and Codes</i></p>	<p>IEC 61215 / IS 14286 IEC 61730 Part 1 and 2</p>
<p><i>Salt Mist Corrosion Testing</i></p>	<p>As per IEC 61701</p>

2. Solar PV Module Mounting Structure

The PV modules shall be mounted on fixed metallic structures of adequate strength and appropriate design, which can withstand the load of the modules and high wind velocities up to 200 km per hour. The support structure shall be hot dip galvanized steel or aluminium.

Detailed specifications for the mounting structure are given below:

<i>Wind velocity withstanding Capacity</i>	200 km / hour
<i>Structure material</i>	Hot dip galvanised steel with galvanisation thickness of min 120 micron or aluminium alloy.
<i>Bolts, nuts, fasteners, panel mounting clamps</i>	Stainless steel SS304
<i>Mounting arrangement for flat Roofs Mounting arrangement for metal</i>	With Removable concrete ballast made of Pre-fabricated PCC (1:2:4), M15 Mounting directly on the sheet metal,

<i>sheet roofs</i>	ensuring stability and wind withstanding capacity, or penetrating the sheet metal and fixing to the substructure, ensuring that the roof remains water proof and ensuring stability and wind withstanding capacity.
<i>Mounting arrangement for elevated structures</i>	The elevated structure has to be securely anchored to the supporting surface. Concrete foundations of appropriate weight and depth for elevated structures mounted directly on the ground; Bolted with anchor bolts of appropriate strength for elevated structures mounted on RCC surfaces.
<i>Mounting arrangement for ground installations</i>	With removable concrete ballast made of pre-fabricated PCC (1:2:4), M15; assuring enough ground clearance to prevent damage of the module through water, animals and other environmental factors.
<i>Installation</i>	The structures shall be designed for simple mechanical on-site installation.
<i>Minimum distance between roof edge and mounting structure (Horizontal Clearance)</i>	>= 0.60 m
<i>Minimum clearance between</i>	Shall not be less than 100mm
<i>Access for panel cleaning and Maintenance</i>	All solar panels must be accessible from the top for cleaning and from the bottom for access to the junction box.
<i>Panel tilt angle</i>	North – south orientation with a fixed tilt angle of 30degrees (depending on location) south facing.

3. Solar Array Fuse

The cables from the array strings to the solar grid inverters shall be provided with DC fuse protection. Fuses shall have a voltage rating of 1,000V DC, current rating as required and shall have DIN rail mountable fuse holders and shall be housed in thermoplastic IP 65 enclosures with transparent covers

4. Solar Grid Inverter

The solar grid inverter converts the DC power of the solar PV modules to grid-compatible AC power.

The detailed specification of the solar grid inverter is given below.

<i>Total output power (AC)</i>	To match solar PV plant capacity while achieving optimum system efficiency
<i>Input DC voltage range</i>	As required for the solar grid inverter DC input
<i>Maximum power point (MPPT) Tracking</i>	Yes
<i>Number of independent MPPT Inputs</i>	1 or more
<i>Output AC voltage</i>	Single phase 230V or Three phase 415V (+ 12.5%, -20%)
<i>Operating Frequency range</i>	47.5 – 52.5 Hz
<i>Nominal frequency</i>	50 Hz
<i>Power factor of the inverter</i>	>0.98 at nominal power

<i>Total harmonic distortion</i>	Less than 3%
<i>Built-in Protection</i>	AC high / low voltage; AC high /low Frequency
<i>Anti-islanding protection</i>	As per VDE 0126-1-1 or IEC 60255.5 or IEC 62116 or equivalent standards
<i>Operating ambient temperature range</i>	-10 oC - +60 oC
<i>Humidity</i>	0 – 95% Rh
<i>Inverter efficiency</i>	:>=95%
<i>weighted efficiency</i>	:94%
<i>Protection degree</i>	IP 65 for outdoor mounting, IP 54 for indoor mounting
<i>Communication interface RS 485 / RS 232 and RJ45</i>	IEC 62103, IEC 62109-1, IEC 62109-2
<i>Safety compliance</i>	Galvanic Isolation
<i>Cooling Convection</i>	LCD for data display. LCD / LED for status display
<i>Display type</i>	
<i>Display parameters to include</i>	Output power (W), cumulative energy (Wh), DC voltage (V), DC current(A), AC voltage(V), AC frequency(Hz), AC current(A); cumulative hours of operation,
<i>Compliance with standards and codes</i>	IEC6163 / IS 61683 & IE 60068 -2(1,2,14,30)

5. DC Distribution Box

A DC distribution box shall be mounted close to the solar grid inverter. The DC distribution box shall be of the thermo plastic IP65 DIN rail mounting type and shall comprise the following components and cable terminations:

- Incoming 2 core(Positive and negative DC) cables from the DC Combiner Box;
- DC circuit breaker, 2 pole (the cable from the DC Combiner Box will be connected to this circuit breaker on the incoming side);
- DC surge protection device (SPD), class 2 as per IEC 60364-5-53;
- Outgoing 2 core cable(Positive and negative DC) to the solar grid inverter.

As an alternative to the DC circuit breaker a DC isolator may be used inside the DC Distribution Box or in a separate external thermoplastic IP 65 enclosure adjacent to the DC Distribution Box. If a DC isolator is used instead of a DC circuit breaker, a DC fuse shall be installed inside the DC Distribution Box to protect the DC cable that runs from the DC Distribution Box to the Solar Grid Inverter.

6.AC Distribution Box

An AC distribution box shall be mounted close to the solar grid inverter. The AC distribution box shall be of the thermo plastic IP65 DIN rail mounting type and shall comprise the following components and cable terminations:

- Incoming 3 core / 5 core cable from the solar grid inverter
- AC circuit breaker, 2 pole / 4 pole
- AC surge protection device (SPD), class 2 as per IEC 60364-5-53
- Outgoing cable to the building electrical distribution board.

7.Connection to Building Electrical System

- a. The AC output of the solar grid inverter shall be connected to the building's electrical system after the DISCOM service connection meter and main switch on the load side. The solar grid inverter output shall be connected to a dedicated module in the Main Distribution Board (MDB) of the building. It shall *not* be connected to a nearby load or socket point of the building.
- b. For buildings or loads with diesel generator backup, the wiring of the solar grid inverter shall be such that the solar grid inverter *cannot* run inparallel with the diesel generator. This implies that the solar grid inverter must be connected to a distribution board on

the grid side of the automatic or manual change-over switch or as per the requirement of DISCOM.

8.Cables

- All cables shall be supplied conforming to IEC 60227/ IS 694 & IEC60502/ IS 1554 Voltage rating: 1,100V AC, 1,500V DC
 - For the DC cabling, XLPE insulated and PVC sheathed, UV stabilised single core flexible copper cables shall be used. Multi-core cables shall not be used.
 - or the AC cabling, PVC or XLPE insulated and PVC sheathed single or multi-core flexible copper cables shall be used. Outdoor AC cables shall have a UV-stabilised outer sheath.
 - The total voltage drop on the cable segments from the solar PV modules to the solar grid inverter shall not exceed 2.0%.
 - The total voltage drop on the cable segments from the solar grid inverter to the building distribution board shall not exceed 2.0%
 - The DC cables from the SPV module array shall run through a UVstabilised
 - PVC conduit pipe of adequate diameter with a minimum wall thickness of 1.5mm. Cables and wires used for the interconnection of solar PV modules shall be provided with solar PV connectors and couplers.
 - All cables and conduit pipes shall be clamped to the rooftop, walls and ceilings with thermo-plastic clamps at intervals not exceeding 50 cm.
 -
 - The minimum DC cable size shall be 4.0 mm² copper. The minimum AC cable size shall be 4.0 mm² copper. In three phase systems, the size of the neutral wire size shall be equal to the size of the phase wires. The following colour coding shall be used for cable wires:
 - DC positive: red (the outer PVC sheath can be black with a red line marking)
 - DC negative: black
 - AC single phase: Phase: red; neutral: black
 - AC three phase: Phases: red, yellow, blue; neutral: black
 - Earth wires: green
- Cable conductors shall be terminated with tinned copper end-ferrules to prevent fraying and breaking of individual wire strands. The termination of the DC and AC cables at the Solar Grid Inverter shall be done as per instructions of the manufacturer, which in most cases will include the use of special connectors.

9.Earthing

- The PV module structure components shall be electrically interconnected and shall be grounded.
- Earthing shall be done in accordance with IS 3043-1986, provided that earthing conductors shall have a minimum size of 6.0 mm² copper, 10 mm² aluminium or 70 mm² hot dip galvanised steel . Unprotected aluminium or copper-clad aluminium conductors shall not be used for final underground connections to earth electrodes.
- A minimum of two separate dedicated and interconnected earth electrodes must be used for the earthing of the solar PV system support structure with a total earth resistance not exceeding 5 ohm.
- The earth electrodes shall have a precast concrete enclosure with a removable lid for inspection and maintenance. The entire earthing system shall comprise non-corrosive components.

10.Surge Protection

- Surge protection shall be provided on the DC side and the AC side of the solar system.
- The DC surge protection devices (SPDs) shall be installed in the DC distribution box adjacent to the solar grid inverter.
- The AC SPDs shall be installed in the AC distribution box adjacent to the solar grid inverter.
- The SPDs earthing terminal shall be connected to earth through the above mentioned dedicated earthing system. The SPDs shall be of type 2 as per IEC 60364-5-53

11.Junction Boxes

Junction boxes and solar panel terminal boxes shall be of the thermo plastic type with IP 65 protection for outdoor use and IP 54 protection for indoor use. Cable terminations shall be taken through thermo-plastic cable glands. Cable ferrules shall be fitted at the cable termination points for identification.

12.Caution Signs

The standard caution and danger boards or labels as per Indian Electricity Rules, the AC distribution box near the solar grid inverter and the building distribution board to which the AC output of the solar PV system is connected shall be provided with a noncorrosive caution label.

13. Metering

The existing service connection meter needs to be replaced with a bidirectional (import kWh and export kWh) service connection meter for the purpose of net-metering.

Installation of the Solar Service Connection Meter will be carried out by DISCOM.

It is mandatory that the Solar Rooftop PV system shall be connected to the Grid as per the guidelines of DISCOMs along with necessary protection devices.

14. Documentation

The Installer shall supply the following documentation:

- a) System description with working principles.
- b) System single line diagram.
- c) Solar PV array lay-out.
- d) Routing diagram of cables and wires.
- e) Data sheets and user manuals of the solar PV panels and the solar grid inverter.
- f) A system operation and maintenance manual.
- g) Name, address, mobile number and email address of the service centre to be contacted in case of failure or complaint.
- h) Warranty cards.
- i) Maintenance register.

15. Test Certificates and Reports to be Furnished

Test Certificates / Reports from IECQ / NABL accredited laboratory for relevant IEC / equivalent BIS standard for quoted components shall be furnished. Type Test Certificates shall be provided for the solar modules and the solar grid inverter to provide evidence of compliance with standards as specified by Ministry of New and Renewable Energy (MNRE). OREDA reserves the right to ask for additional test certificates or (random) tests to establish compliance with the specified standards.

16. CONFIRMATION TO MNRE TECHNICAL SPECIFICATIONS AND STANDARDS

- The vendor should ensure that all components and systems used under this Scheme shall strictly adhere to the Technical Specifications and Guidelines issued by MNRE vide Notice no: 30/11/2012-13/NSM dated 26th May 2014, as
- “Operational Guidelines for Implementation of Off-Grid and Decentralized Solar Applications Sub Scheme – “Off-Grid and Decentralized Solar PV Applications” during 12th Plan Period”, and as amended from time to time.

- The vendor should also ensure all compliance to OERC Order No OERC-Engg.02/2010(Vol-III)/1597(A) Dated 26.11.2014 and its subsequent amendments.

Application Form

A. Vendor's Details

1	Name of the Vendor		
2	Contact Details	Address Line 1	
		Address Line 2	
		Address Line 3	
		City	
		State	
		PIN	
		Phone 1	
		Phone 2	
		Phone 3	
		Fax	
		Email	
		Website	
3	Name of authorised Person for all Contacts by OREDA /Users		
		Address Line 1	
		Address Line 2	
		Address Line 3	
		City	
		State	
		PIN	
		Phone 1	
		Phone 2	
		Fax	
Email			
4	Category	Company	
		Firm	
5	Registration Details <i>(Enclose Copy)</i>	Registering authority	
		Registration No	
		Date of Registration	
		Place of Registration	
6	Type <i>(Enclose Copy)</i>	Manufacturer	
		System Integrator	
7	Accreditation Details <i>(Enclose Copy)</i>	Name of the Agency	
		Date of accreditation	

		Rating given	
		Valid through	
8	Tax Registration Details (Enclose Copy)	VAT	
		OVAT	
		STCC	
		ITCC	

B. Details of Technical and Financial Capability

1	Types of PV systems manufactured /integrated by the Vendor	System 1		
		System 2		
		System 3		
		System 4		
2	Annual Capacity to manufacture/ Integrate Solar PV systems (MW) (Enclose Stores Details Certificate by Competent Authority)			
3	No/Capacity (MW) of PV systems installed so far	System 1	Nos	Cumulative Capacity
		System 2		
		System 3		
		System 4		
4	No/Capacity (MW) of rooftop PV systems installed so far	Nos	Cumulative Capacity (MW)	
5	Minimum Capacity of Roof-top PV Power Plant (single unit)installed (KW)			
6	Maximum Capacity of Roof-top PV Power Plant (single unit) installed (KW)			
7	Names of Major Customers	Customer 1		
		Customer 2		
		Customer 3		
		Customer 4		
		Customer 5		
8	Quality Assurance System adopted	Product Compliance		

		Process compliance	
		Environmental Compliance	
9	Annual Turnover (in Rs Lakhs) in the business of Solar PV alone for last 3 years	2014-15	
		2013-14	
		2012-13	
10	Amount of taxes deposited (In Rs lakhs) during FY 2015-16	Tax 1	
		Tax 2	
		Tax 3	
		Tax 4	

Signature of Applicant
Date :

Forwarding Letter
(to be submitted in the letter head of the applicant)

To,

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

Subject: Submission of application for empanelment with OREDA for Supply, Installation, Commissioning & Maintenance of rooftop solar power plants directly in customers' premises under the Off-grid and Decentralized Solar Applications under JnNSM, MNRE, Gol.

Sir,

Having studied the call for empanelment document carefully I/we, the undersigned, offer to submit our application for empanelment for Supply, Installation, Commissioning & Maintenance of rooftop solar power plants directly in customers' premises under the Off-grid and Decentralized Solar Applications under JnNSM, MNRE, Gol in conformity of the said document.

I/We have also read the various provisions therein and confirm that the same are acceptable to us. We further declare that any additional conditions, variations, deviations, if any, shall not be given effect to. We further understand that **any deficiency / illegibility in documents shall make our application liable for rejection.**

I/we submit our application understanding fully well that

- (a) The documents submitted along with our application are subject to verification by appropriate authorities.
- (b) OREDA reserves the right to accept or reject any application or the empanelment process itself without assigning any 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.
- (d) All acts, rules, regulations, norms and conditions of Govt of India and Govt of Odisha shall be applicable during the process of empanelment as well as during the period of execution of project.

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 application has been submitted in good faith and the information contained is true and correct to the best of our knowledge and belief.

Yours faithfully,
Signature of Applicant

UNDERTAKING BY THE APPLICANT

I/we here by undertake that

1. We have thoroughly read and examined the call for empanelment document along with all its schedules, annexure etc.
2. In case our application is incomplete in any respect or we violate any of the prescriptions given therein OREDA shall, without prejudice to any other right or remedy, be at liberty to forfeit the application fee, processing fee deposited by us.
3. In case of award of supply / installation 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 supply / installation.
4. 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.
5. The entire CALL FOR empanelment document has been discussed in the Board meeting and a resolution has been concurred for participation in the empanelment process(copy enclosed)
6. We are not involved in any litigation that may have an impact of affecting or compromising the delivery of services as required therein.
7. We are not blacklisted / defaulted in any manner by any Central / State Government / Public Sector Undertaking in India.
8. In case any false documents submitted and found any time in future the firms shall be liable to be proceeded against as per prevailing laws.
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.

Signature of Applicant with stamp & date

Letter of Authorization

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

To,

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

Sub: Submission of application for empanelment with OREDA for Supply, Installation, Commissioning & Maintenance of rooftop solar power plants directly in customers 'premises under the Off-grid and Decentralized Solar Applications under JnNSM, MNRE, GoI.

Ref: Call for empanelment **Notice No. / OREDA, dt.**

Sir,

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

We further authorize Ms. /Mr. _____ designation..... of our company to make technical presentation on behalf of the company.

Signature of the authorize persons

1. _____
2.

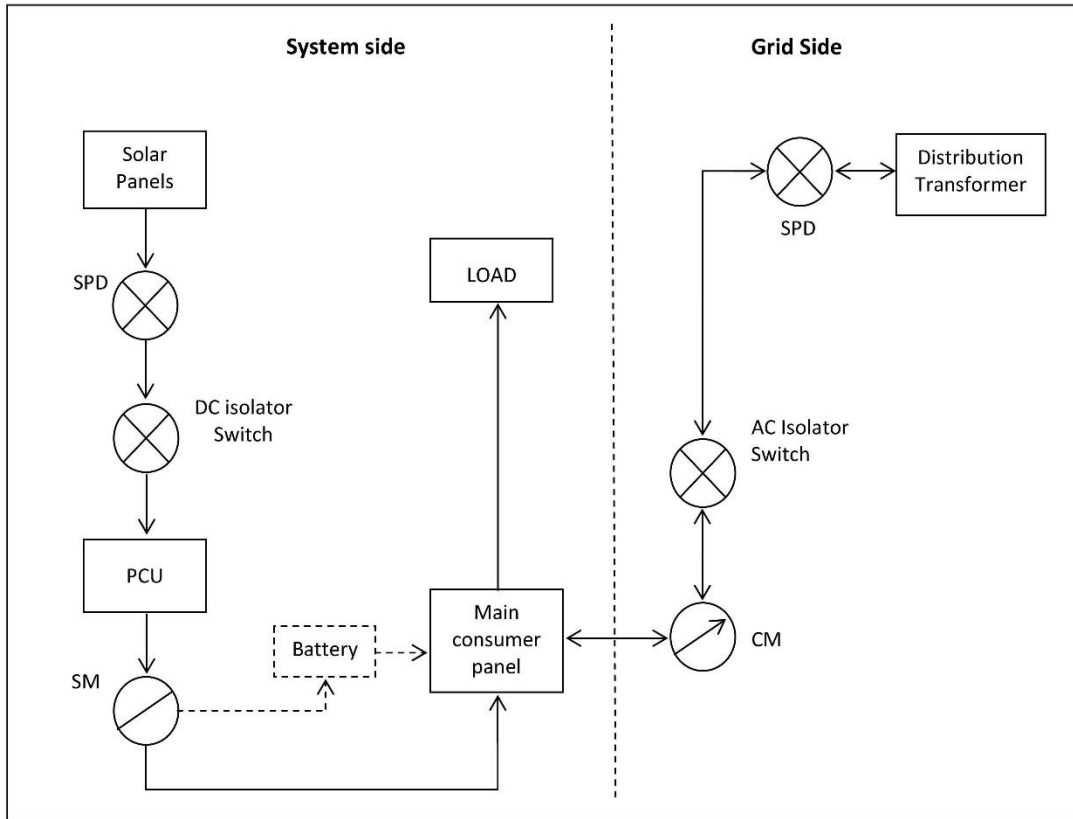
Signature attested

Name and designation of the attesting officer with stamp.

Yours faithfully

Head of the Applicant organization

Overview of a basic grid interactive Photo Voltaic system



SPD- Surge Protective Device, PCU- Power Conditioning Unit, SM-Solar Generation Meter, CM- Consumer Meter (Net meter or Bi-directional meter)

* The actual connectivity diagram may vary depending upon site specification.