INDENT FOR ARRANGING RATE CONTRACT FOR SUPPLY, INSTALLATION AND COMMISSIOING OF GRID CONNECTED ROOFTOP (GCRT) SOLAR POWER PLANTS (HYBRID, WITH BATTERY BANK) IN THE STATE FOR THE YEAR 2026-27.

DNRE is State Nodal department for promotion of grid-connected roof top (GCRT) solar power projects for Government sector in the State of Haryana. Haryana Government vide notification no. 22/52/2005-5 Power dated 19.12.2017 has made the installation of Solar Power Plant on All Government Buildings mandatory having sanctioned load above 30 KW. The generated solar power will be utilized for captive consumption under the Net Metering Regulations notified by the Haryana Electricity Regularity Commission (HERC) vide notification no. HERC/54/2021 dated 19th July, 2021 (Haryana Electricity Regulatory Commission (Rooftop Solar Grid Interactive Systems Based on Net Metering/Gross Metering), Regulations, 2021 and its amendments, if any. It will also help to reduce electricity bills of concerned building and promote pollution free power thus saving environment.

A. BRIEF DESCRIPTION OF RATE CONTRACT ITEM:

Sr. No.	Description of Stores	Quantity/ Value of RateContract	Place of Delivery
1	Supply, installation and commissioning of Grid Connected Rooftop Solar Power Plants with battery bank (with Net Metering Facility) including comprehensive maintenance for a period of 07 years, including supply of solar generation & bi-directional meter.	On Annual Rate Contract basis The approximate investment by bidders is **Rs. 3685.0 Lakh** for **4.25 MW** aggregated capacity	Anywhere in Haryana/ Chandigarh

The detailed technical specifications/ description of the above stores are available at **Annexure-I** of this document.

B. DETAILS OF WORKS:

Annual Rate Contract for tentative aggregate capacity of **4.25 MWp** of Grid Connected Rooftop (GCRT) SPV Power Plants (hybrid with battery bank) for design, Supply, Erection, Testing & Commissioning including comprehensive maintenance for a period of 07 years at various places in State of Haryana/Chandigarh, including supply of Solar Generation & Bi-Directional Meters.

Following are the tentative rates and quantity (which may be interchanged as per requirement) of the tender:

Capacity of GCRT Hybrid Solar Power Plants (With Battery Bank)	**Estimated Number**	**Total Quantity, kW**	**Estimated cost, Rs./W**	**Total Value, Rs. In Lakh**
01 kWp (with single Phase PCU)	100	100	125	125
02 kWp (with single Phase PCU)	200	400	100	400
03 kWp (with single Phase PCU)	200	600	95	570
04 kWp (with single Phase PCU)	100	400	85	340
05 kWp (with three Phase PCU)	200	1000	85	850
7.5 kWp (with three Phase PCU)	100	750	80	600
10 kWp (with three Phase PCU)	100	1000	80	800
TOTAL	**1000**	**4250**		**3685**

***Capacity may be interchanged**

C. THE SCOPE OF WORK SHALL ALSO INCLUDE THE FOLLOWINGS:

a. The bidder can bid for complete capacity. Bids for partial capacity will not be accepted.

b. Detailed planning for time bound smooth execution of Project;

c. The Supplier shall provide such packing of the Goods as is required to prevent their damage or deterioration during transit to their final destination. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the Goods' final destination and the absence of heavy handling facilities at all points in transit.

d. Supplier shall be responsible for delivering all the equipment at site under his own arrangement within the stipulated time frame.

e. The goods supplied under the contract shall be fully insured against loss or damage incidental to manufacture of acquisition, transportation and delivery to site by the supplier at his own cost. Once the material has been supplied at the user site, the storage facility (with lock & key arrangement for the supplier) may be provided by user department/organisation for 15 days only, as it is assumed that within 15 day the systems will be installed.

f. Performance testing of the complete Project;

g. After sales service through service center(s);

h. Coverage of risk liability of all personnel associated with implementation and realization of the Project;

i. Training of at least one person each to be nominated by user at every location, on the various aspects of design and maintenance of the Project after Commissioning of the Project.

j. The Successful Bidder shall maintain sufficient inventory of the spare parts to ensure that the Project is functional during the period of warranty period.

k. The Successful Bidder shall run the Project on trial basis and shall closely monitor the performance of the Project before handing over the same.

l. Comprehensive maintenance of the Project at every location, from the date of the Commissioning of Project has to be carried out by the Successful Bidder.

m. Supervision of the on-site assembly and/or start-up of the supplied Goods.

n. Furnishing of detailed operations and maintenance manual for each appropriate unit of supplied Goods;

o. Performance or supervision or maintenance and/or repair of the supplied Goods, for a period of time agreed by the parties, provided that this service shall not relieve the Supplier of any warranty obligations under this Contract;

p. SAFETY MEASURES: The bidder shall take entire responsibility for electrical safety of the installation(s) including connectivity with the grid and follow all the safety rules & regulations applicable as per Electricity Act, 2003 and CEA guidelines etc.

The detailed technical specification/ description of the above stores is available at **Annexure-I** of this document.

D. SPECIFIC TERMS & CONDITION/ ELIGIBILITY CRITERIA RELATED TO ABOVE STORE:

1. Technical Eligibility Criteria:

i. The Bidder should be either a body incorporated in India under the Companies Act, 1956 or 2013 including any amendment thereto or proprietary/partnership firm/LLP firm. A copy of certificate of incorporation shall be furnished along with the bid in support of above.

ii. The bidder should have also a valid ISO 9001:2015 Certificate issued from any NABCB accredited certification body in the field of quoted item and copy of valid ISO 9001:2015 Certificate must be attached with offer.

iii. The bidder should be a manufacturer of ***solar module/inverter/PCU/solar cell/LiFePO$_4$ battery cells*** or System Integrator. The System Integrator has to submit the undertaking (**in Performa-IV**) issued by each manufacturer of major parts/devices (solar modules/inverter/battery) with whom they have tie up mentioning that in case System Integrator defaults, at any stage of execution of warrantee/guarantee/CMC and after sale service of the said device, installed in reference to rate contract of the said tender, then the Company will be responsible to execute the warrantee/guarantee/CMC of the said device at site of installation as per the terms and conditions of rate contract/DNIT of the above tender and will adhere the directions of the New & Renewable Energy Department/HAREDA directly. The concerned manufacturer shall only be responsible for guarantee/warrantee/CMC/ after sale service of the product(s) supplied by them and not for the whole of solar power plant.

iv. Domestically manufactured PV Module with domestically manufactured solar PV cells should be used. The PV modules must have BIS certificate for IS 14286 & IS 61730 (Part-I, Part II). PV modules must meet the latest specifications of MNRE and the models and Manufacturers of PV Modules shall be included in the List of Models and Manufacturers for Solar PV Modules empanelled by MNRE as per its ALMM order (and shall also be valid at the time of supply of material) as amended from time to time. The inverters/PCU/should be tested from the MNRE approved test centers/ NABL/ BIS/ IEC accredited/authorized testing- calibration laboratories. In case of imported inverter/ power conditioning units, these should be approved by international test houses. However, if there are any instructions of MNRE regarding of the approval of inverter/Power Conditioning Unit, then the inverter/PCU shall be as per latest specification as per instructions/guidelines of MNRE applicable at the time of submission of bid and also at the time of supply.

v. To bring contractual clarity, Bidders has to give explicit declaration that they are aware of binding provisions of the ALMM Order and the List(s) there under, while quoting the rates in the bid.

vi. *The bidder has to submit the test reports of Solar PV Modules, Inverters/PCU and LiFePO$_4$ battery cells with the tender.*

vii. *If manufacturer claims the MSME of Haryana, then the test report of **solar module/ inverter/solar cell/LiFePO$_4$ battery cells**, as the case may be, in the name of bidder shall be provided with the bid. The manufacturer of **solar module/ inverter/solar cell/LiFePO$_4$ battery cells**, shall be eligible for MSME benefit.*

viii. *If system integrator is manufacturer of any of the major part/device (solar modules/inverte/PCU/ LiFePO$_4$ battery cells) then it is not required to submit the undertaking (in **Performa-IV**) related to that particular item/device.*

ix. All the Test Certificate(s)/BIS/IEC certification should be valid on the closing date of the tender and also at the time of supply.

2. Experience and Past Performance

Bidder should have successfully completed Supply, Installation & Commissioning of ***Rooftop Solar Power Plants or Ground Mounted Solar Power Plants or Solar Pumps*** **or other solar systems** of minimum cumulative capacity of **1.70 MW** to any State / Centre Govt. Agency / Department/ Organization/ autonomous body/ private sector duly verified by SNA/any govt. agency from **01.04.2021** to the closing date of the bid.

The bidders are requested to enclose the proof of completion of the required capacity projects duly certified by SNA/any Government agency.

(Document to be uploaded: Only Commissioning Certificates certified by SNA or any Government agency supporting the claim. **Bidders shall not upload the work orders**)

3. Financial Eligibility Criteria:

i. The bidder should have minimum average annual turnover of **Rs. 1105.0 Lakh** in the last three years, ending 31st March 2026.

*(Document to be uploaded: The annual Turnover Certificate in given format **(Performa-I)** duly certified by CA).*

ii. The bidder should have positive net worth in the last three Financial Years.

*(Document to be uploaded: Certificate in given format **(Performa-V)** certified by CA.)*

iii. The rates quoted should be inclusive of GST (@8.9%) and all other charges etc. (as applicable).

4. Delivery period (includes supply, installation & commissioning)/Time Schedule, Penalty/Liquidated Damages:

a. The time schedule for these systems shall be as under:

Capacity of Solar Power Plant	Time period for completing thework which includes inspection,supply, installation and commissioning
1	2
1kWp -10 kWp	3 months from the date of work order

i. Pre-Dispatch Inspection: The inspection of the material will be carried out by the committee constituted by indenting department or their authorized representatives at the premises of the supplier or at site.

ii. It shall be the sole responsibility of the supplier to complete the commissioning of systems in the defined time period. Time period is the essence of the contract. GCRT Solar Power plant will be taken as commissioned on the date of start of inverter and ready to synchronize, it will not depend the installation of solar generation meter/Bi-Directional meter by DISCOMs. However, solar generation meter (with CT, if required)/bi-directional meter along with CT/PT shall be submitted to the DISCOMs for testing and installation within 07 days of commissioning of the system by the supplier.

iii. After receipt of call for inspection with date for the inspection, the material shall be inspected by the Director, New & Renewable Energy Department/ HAREDA/indenting officer or a committee authorized for this purpose. Material shall be dispatched after acceptance of the same by the Inspection Committee, if inspected at premises of the firm; The same shall be installed and commissioned after acceptance by the Inspection Committee, if inspected at site. However, the supplier may start civil work at any time even before the inspection of material.

iv. If the proposal for pre-dispatch inspection is received within defined & valid time period in the office of Director, New & Renewable Energy Department/HAREDA/indenting office from the supplier and inspection is not carried out by the New & Renewable Energy Department due to any reasons within 07 days of receipt of such letter/offered date, the time period for supply, installation & commissioning will be extended equivalent to delayed period, from the next day of expiry of these 07 days till the date of

actual inspection and no penalty will be imposed for this extended period.

b. Before placing the work order, bidder will have to ensure that site is clear and feasible in all respect for installation of system/plant. However, it will be the sole responsibility of the supplier to be satisfied with the site through visit under intimation to PO/APO of the district within 30 days of placing of work order. Request, if any, received from the supplier for any extension on ground of issue of site clearance after above said period will be out rightly rejected

5. Warranty: -

i. The Warranty period shall be seven (07) years for complete system from the date of commissioning and handing over of the system (or as per latest MNRE, GoI guidelines). The contractor shall rectify defects developed in the system within Warranty period promptly.

ii. The manufacturer should warrant the Solar Module(s) to be free from the defects and/or failures for a period of twenty-five (25) years from the date of commissioning of the system

iii. The predicted electrical degradation of power generated not exceeding 20% of the minimum rated power over the 25 year period and not more than 10% after ten years period of the full rated original output.

The procedure to rectify the complaint/service to be provided during warrantee period is as follows:

During the warrantee period, the firm shall ensure proper functioning of the systems and complaint, if any, forwarded to the supplier against the system, will have to be attended within 72 hours of forwarding such complaints. If any part is to be procured then the user is to be informed and the systems shall be rectified within 7 days. The procedure to rectify the complaints shall be as under:

a. The notice through E-mail/hard copy to rectify the complaints shall be issued by the HQ/district officer/User to the supplier with copy to the New & Renewable Energy Department/HAREDA. This shall be followed by two reminders on 3 days intervals each. The district office shall maintain proper record of the complaints.

b. In case of failure to do so, penalty @ 0.1 % of the system cost per day (subject to max. 10% of the cost) after expiry of 07 days shall be imposed. If the firm does not attend the complaint within the maximum penalty period then the system may be got repaired/ replaced from the performance security amount. In case whole performance security amount is utilized and complaint/s are still pending then an online / registered notice will be sent to the firm to attend the complaint and if failed to attend the complaint within 7 days then firm may be blacklisted and a legal proceeding may be initiated against the firm for breach the agreement. If maximum penalty has been imposed, then the firm shall deemed to be considered as unfit to participate in all the tenders floated by New & Renewable Energy Department/HAREDA in future for a period to be decided by competent authority, effective from the date of communication to be conveyed by New & Renewable Energy Department/HAREDA in written and shall be treated as unsatisfactory performer.

iv. DGS&D/New & Renewable Energy Department/HAREDA/the consignee will have the liberty to get the sample for the item(s) supplied tested from any of the Govt. approved laboratory at any time during the installation or warranty period to ascertain the performance of the item(s) as per DNIT specifications. If during the lab test, sample fails then supplier has to repair/ replace the defective systems within 15 days of issue of such notice. If on the request of the supplier

more than one samples are drawn for lab test and any one of them fail the lab test, bidder has to replace all the defective system at his own cost.

v. The Contractor/supplier shall continue to provide spare parts for at least two years after the expiry of warranty period at the users cost. If the contractor fails to continue to supply spare parts and services to users, then New & Renewable Energy Department/HAREDA/DGS&D shall take appropriate action against the firm which can be to ban the supplier for participating in future tenders.

6. Terms and Condition for Payments

The payments shall be made by the indenting department/organisation as per the following terms and conditions:

i. **70% payment** after installation of the system supported with Joint Commissioning Report (Provisional) signed by Supplier, representative of user organization & P.O. of the concerned district along with bill & photographs of complete system.

ii. **23% payment** on submission of Final Joint Commissioning Report (JCR), supported with project completion report, duly signed by the supplier, district PO. However, if the supplier submits the Solar Generation meter (with CT, if required) and Bi- Directional meter (with CT/PT, if required) and there is delay on the part of DISCOMs for installation of Net Meter beyond 15 Days of submission of the meters to DISCOMs or beyond 15 days of installation of system whichever is later, then this payment to the Supplier may be released within next 15 days on the basis of Provisional Joint Commissioning Report & PCR (Status of submission of meters etc. shall be mentioned, if NM is pending for installation at level of user/DISCOMs).

iii. **07% payment** to be released on completion of 07 years from the date of commissioning of the plant, on submission of satisfactory performance report of the systems duly certified by the concerned PO/APO and user OR The said amount may be released against the submission of bank guarantee of equal amount valid for seven years from the date of commissioning of the plant.

iv. **Income Tax shall be deducted at source as per rules.**

7. Insurance

System should be insured for entire warranty period of 07 for natural calamities, theft & burglary etc.

8. Validity of Rate Contract

The rate contract shall remain valid for a period of two years from the date of its issue.

9. Performance Bank Guarantee (PBG)

Successful bidders shall have to deposit 25% of the total applicable PBG (based on total allocated capacity) to the Department of Supplies & Disposal Department, Haryana and after exhausting of 25% allocated capacity, the successful bidders shall have to again deposit 25% of the total applicable PBG and so on.

10. Other Terms and Conditions

a) The offer shall be submitted online only. No tender will be accepted in physical form.
b) Before submission of online bids, the bidder must ensure that scanned copies of all the necessary documents have been uploaded with the bid. All the document uploaded must be legible, illegible documents will not be considered.
c) Nodal Agency will not be responsible for any delay in online submission of bids due

to any reason whatsoever.

d) The price quoted should be FOR anywhere in the State of Haryana/Chandigarh inclusive of all taxes and duties, custom duty, excise duty, service tax, sales tax, C.S.T., local taxes, GST, Income Tax, Surcharge on income tax etc. if any, including 07 years warranty (or as notified in the bid) of the complete system/ plant. A supplier/ contractor shall be entirely responsible for all taxes, duties, license fees, etc. All taxes payable as per Government income tax & service tax norms will be payable by the contractor. If any new tax/duty is levied during the contract period the same will be borne by the firm exclusively. TDS will be deducted from the payment of the contractor as per the prevalent laws and rules of Government of India and Government of Haryana state in this regard.

e) Material shall be strictly as per DNIT specifications. If there is any left out specification, the same shall be considered as per the latest specifications applicable as per MNRE/ BIS/International Standards.

f) In case of any ambiguity in interpretation of any of the clauses/ provision of the said rate contract/DNIT, the decision of the Director, HAREDA or Director Supplies & Disposals Department Haryana shall be final and binding.

g) It shall be the sole responsibility of the contractor to get verified the quality & quantity of the supplied material at the site of delivery.

h) The Contractor shall indemnify the HAREDA against all third party claims of Infringement of patent, royalty's trademark or industrial design rights arising from use to the goods or any part thereof.

i) Contractors, wherever applicable, shall after proper painting, pack and crate all the equipment in such manner as to protect them from deterioration and damage during rail and road transportation to the site and storage at the site till time of installation. Contractor shall be held responsible for all damage due to improper packing/handling.

j) All demurrage, wharfage and other expenses incurred due to delayed clearance of the material or any other reason shall be to the account of the contractor.

k) The goods supplied under the contract shall be fully insured against loss or damage incidental to manufacture or acquisition, transportation, shall be included in the bid price.

l) DGS&D may at any time terminate the contract by giving written notice to the contractor without compensation to the contractor, if it becomes bankrupt or otherwise insolvent, provided that such termination will not prejudice or affect any right of action or remedy, which has accrued or will accrue thereafter to the NRE/HAREDA.

m) NRE/HAREDA/DGS&D, may by written notice sent to the supplier, terminate the contract, in whole or in part at any time for its convenience.

n) To assist in the examination, evaluation and comparison of bids the DGS&D may at its discretion ask the bidder for a clarification of its bid. The request for clarification and the response shall be in writing.

o) At any time prior to the submission of the tender or prior to the opening of the technical bids, the DGS&D may, for any reason, whether at its own initiative or in response to a clarification requested by the Bidder, modify the Tender documents by amendment/corrigendum.

p) Any material /instrument required to complete /successful running of the project which is not mentioned in the DNIT will be provided by the bidder in the quoted rates only and no additional payment shall be made.

q) Not more than one tender should be submitted by one contractor or by a firm of contractors for the same work.

r) Under no circumstances will a father or his son or their close relation or the partner of one firm be allowed to tender as separate tender. A breach of this condition will cause the tenders of such parties liable for rejection, forfeiture of their earnest money and the firm may be black listed.

The firm (s) tendering shall clearly mention in their tender whether any of the close/near relative of their management/management of sister concerned firms is in the employment of the HAREDA/Department of New & Renewable Energy, Haryana and in case their close/near relative is in employment of the HAREDA/Department of New & Renewable Energy, Haryana then his/her name, designation and place of posting to be mentioned.

If the tendering firm do not disclose and furnish the correct information as required in above clause, then his earnest money and/or Performance Security Deposit may be forfeited and in case the contractor has been awarded the work, the same may be cancelled. For concealing any information, the firm may be black listed.

Note:

The word "Close/ Near Relative" mentioned in the above clause means father, mother, brother, sister, brother-in-law, sister-in-law, daughter-in-law, daughter, father-in-law, mother-in-law, son, son-in-law, first cousin of self/spouse, spouse, father-in-law and mother-in-law of son/daughter.

s) Income Tax/Cess will be deducted at source from contractor' bills/dues in accordance with latest Govt. orders from time to time. The contractor will have no objection to this effect.

t) The manufacturer shall supply all technical literature and drawing considered necessary for the installation, operation and maintenance of the equipment and its fittings.

u) The firm shall put up a MS iron display board (at least of the size 3'x2'), whereas asked by the HAREDA, duly painted at site indicating salient features like year of installation, capacity of system, cost, technology, important technical parameters etc. along with the names of MNRE, GoI and HAREDA as the sponsoring agency after approval of the same from HAREDA.

v) EMD is liable to be forfeited in case of evidence of cartel formation by the bidder(s). Further, in case where cartel formation amongst the manufacturers-suppliers is apparent, complaint shall be filed with the Competition Commission of India and/or other appropriate forum. EMD is liable also to be forfeited in case of submitting forged/false/fabricated documents.

w) DGS&D reserve the rights to verify the claimed capacity of the bidder, at any stage, from their own or through a third party. Bidder/successful supplier will have to extend all cooperation. If the claim of the bidder is found negative, then DGS&D may consider reject/cancel the bid/contract.

x) Bidder who is manufacturer of ***solar module/ inverter/solar cell/LiFePO$_4$ battery cells*** (to be used in the system) and manufacturing the said item (s) in its unit and having valid test report of, tested as per MNRE, GOI latest guidelines/BIS for minimal technical specifications of the tender document in its own name (the bidder) issued by MNRE/NABL/IEC accredited testing center shall be treated as manufacturer for getting the benefits of concession under MME/MSME policy. The test report shall be issued by the date of closing of the tender and shall be valid as on date of opening of the technical bid. The bidder shall have manufacturing facility of the said item, with testing facility, in its unit.

*(**Documents to be uploaded:** Test certificate of the component manufactured by bidder (i.e. **solar module/ inverter/solar cell/LiFePO$_4$ battery cells**) in the name of bidder).*

y) Grievance redressal Mechanism for participating Bidders/Firms in the e-procurement of the State will be as per vide GO No. 2/2/2016-41-B-II dated 25.7.2016 by Department of Industries & Commerce, Haryana. All the bidders/Firms who want to make any representation/ complaint against any issue related to their technical scrutiny of the bids may do the same within 5 working days (up to 5.00 PM of the fifth working day) of the date of issue of letter/intimation regarding their as per NIT/Not as per NIT status. They have to ensure that their communication is delivered/reached within 5 working days and delay in postal will not be counted as a valid reason.

z) No representation/complaint in whatsoever manner from the bidders/firms will be entertained after the opening of financial bid.

11. Instructions to Bidders

i. Bid for arranging the rate contract for design, supply, installation, testing & commissioning of Grid Connected Rooftop Solar Power Plants with battery bank for tentative aggregated capacity as given above. The detailed bid document can be viewed and downloaded from the web-site, https://.....

ii. The Bidder is advised to read carefully all instructions and conditions appearing in Bid document and understand the scope of work fully. All information and documents required as per the Bid document must be furnished with bid. Failure to provide the information and/or documents as required shall render the bid unacceptable for evaluation of technical bid. All bidders qualifying technical stage shall be treated at par. Financial Bid of Bidder qualifying at technical stage only shall be opened.

iii. Bidder shall be deemed to have examined the Bid document, to have obtained information in all matters whatsoever that might affect the carrying out of the works in line with the scope of work specified in the Bid document at the bid price and to have satisfied himself of the sufficiency of his bid. The Bidder shall be deemed to know the scope, nature and magnitude of the works and requirement of materials, equipment, tools and labour involved, wage structures and as to what all works Successful Bidder shall have to complete in accordance with the Bid Document irrespective of any defects, omissions or errors that may be found in Bid document.

iv. Bidders having been blacklisted by HAREDA or by any State Govt. / PSU/Cenral Govt., for whatever reasons, shall not be eligible/ allowed to participate in this Bid.

v. Bidder shall not be placed under the Negative List of MNRE as on the tender closing date.

vi. The bidding process is for arranging the rate contract for tentative **4.25 MWp** aggregated capacity of Grid Connected Rooftop Solar Power Plants/Projects (with battery bank) under EPC cum comprehensive maintenance mode at various locations in the state of Haryana, India. However, total capacity as indicated above may go up to 1.5 times of tendered capacity, if required. Successful bidders will have to unconditionally agree to the additional quantum beyond the tendered capacity under the same terms and conditions.

vii. Bidder must meet the eligibility criteria independently as a company. Consortium of Companies is not allowed in any form. Bidder will be declared as a Technically Qualified Bidder based on meeting the eligibility criteria and as demonstrated based on documentary evidence submitted by the Bidder in the Bid.

viii. The Successful Bidder shall be required to establish at least one Service Centre at division level in Haryana.

ix. The Bidders shall have to submit their bid and other required relevant documents/ certificates, if any; online only as per time schedule (Key dates). Bid other than online will not be accepted by the Nodal Agency.

x. Bidder/firm having common director with the bidder should have not been debarred/blacklisted by any Govt. Deptt's / organization/ PSU's / institutions/ agencies/ autonomous Organizations/Ministry of Corporate Affairs. If any bidder provides false information regarding debarred /blacklisted or conceals the facts in this regard, Nodal agency reserves the right to forfeit both EMD & Performance Bank Guarantee of the bidder, to black list the bidders and also may cancel the contract.

xi. The Bidder should have valid GST & PAN registration certificate. A copy of which should be enclosed.

xii. The past performance of the firm/sister concern firm shall be considered while evaluating the technical bids. If bidder has poor record for supply & installation or for providing after sales service/ maintenance then bidder may be treated as not technical eligible.

xiii. The bidder must submit all the formats as per Annexure-IA.

Note: The Standard Terms & Condition & Policy matters may be incorporated by the Supplies & Disposals Department.

ANNEXURE-I

DETAILED TECHNICAL SPECIFICATIONS

(Grid Connected Solar Rooftop Photo Voltaic (SPV) power plant-hybrid, with battery bank)

1. DEFINITION

A Grid Connected Solar Rooftop Photo Voltaic (SPV) power plant consists of SPV array, Module Mounting Structure, Inverter consisting of Maximum Power Point Tracker (MPPT), and Controls & Protections, interconnect cables and switches. PV Array is mounted on a suitable structure. Components and parts used in the SPV power plants including the PV modules, battery, metallic structures, cables, junction box, switches, inverters etc., should conform to the BIS or IEC or international specifications, wherever such specifications are available and applicable.

Solar PV system shall consist of following equipment's/components:

- Solar PV modules consisting of required number of Crystalline PV cells.
- Grid interactive Inverter with Remote Monitoring System
- Batteries
- Mounting structures
- Junction Boxes.
- Earthing and lightening protections.
- IR/UV protected PVC Cables, pipes and accessories

2. SOLAR PHOTOVOLTAIC MODULES:

(i) The PV modules/cell shall be of indigenous make.

(ii) SPV array contains specified number of same capacity, type and specifications modules connected in series or parallel to obtain the required voltage or current output. A Sufficient number of modules in series and parallel could be used to obtain the required voltage or current output.

(iii) The power output of individual SPV modules used in the SPV array, under STC, should be a minimum of **500 Wp**, with adequate provision for tolerances measurement. Use of SPV modules with higher power output is preferred.

(iv) Modules supplied with the SPV power plants shall have a certificate as per IS 14286/IEC 61215 specifications or equivalent National or International /Standards. STC performance data supplied with the modules shall not be more than one year old.

(v) Modules must qualify to IS/IEC 61730 Part I and II for safety qualification testing.

(vi) The minimum module efficiency should be **19.5 percent** and fill factor shall be more than 75 percent.

(vii) Modules must qualify to IS 170210 (Part 1) for the detection of potential-induced degradation - Part 1: Crystalline silicon (Mandatory in case the SPV array Open Circuit voltage is more than 600 V DC)

(viii) The name plate of SPV module shall conform to IS 14286/IEC 61215.

(ix) Module to Module wattage mismatch in the SPV array shall be within ± 3 percent.

(x) The SPV modules must be warranted for output wattage, which should not be less than 90% of the rated wattage at the end of 10 years and 80% of the rated wattage

at the end of 25 years.

(xi) The RFID tag shall be placed inside the glass laminate of the SPV modules

(xii) The rated output power and efficiency of any supplied module should not be less than the power and efficiency defined in the bid. No negative tolerance for rated output power and efficiency of any supplied module shall be allowed.

(xiii) The module should have the following minimum information laminated inside the module.

- Made in India (to be subscribed in words)
- Company name/logo
- Model number
- Serial number
- Year of make

NOTE:

The latest MNRE specifications/ALMM requirement of SPV solar module at the time of tender submission/supply will be applicable.

3. PERFORMANCE WARRANTY:

a. Material Warranty:

i. Material Warranty is defined as: The manufacturer should warrant the Solar Module(s) to be free from the defects and/or failures for a period of twenty five (25) years from the date of commissioning of the system

ii. Defects and/or failures due to manufacturing (it should indicate the voltage and rated wattage of the module)

iii. Defects and/or failures due to quality of materials

iv. Non conformity to specifications due to faulty manufacturing and/or inspection processes. If the solar Module(s) fails to conform to this warranty, the manufacturer will repair or replace the solar module(s), at the owners sole option.

b. Performance Warranty:

The predicted electrical degradation of power generated not exceeding 20% of the minimum rated power over the 25 year period and not more than 10%after ten years period of the full rated original output.

4. ARRAY STRUCTURE (MODULE MOUNTING STRUCTURE):

Module Mounting Structure (MMS) should be Hot Dipped Galvanised Iron (HDGI), of prescribed Specifications given below, for mounting of SPV modules at site. The panel frame structure should be capable of withstanding a minimum wind speed load of 150 KM per hour, after grouting and installation. MMS should be sturdy & designed to assist SPV Modules to render maximum output. The hardware (fasteners) used for installation of SPV Modules & MMS should be of suitable Stainless Steel (SS 304). Each MMS should be with minimum four legs grouted on pedestals of minimum 300X300X250 mm with anchoring/ chipping & chemical sealing of foundation based on RCC roof. Foundation bolts of stainless /GI steel should be at least 300 mm long.

Its size should be with reference to the specifications of the selected make SPV modules. Anti Theft Nut Bolts of SS (with washers) should be used for mounting modules for better theft proofing.

4.1 **Hot Dipped Galvanised Iron (HDGI) structure should meet the following minimum specifications:**

Rafter	: 60mmX60mmX3.2mm
Purlin	: 90mmX45mmX15mmX2.6mm
Vertical Post	: 60mmX60mmX3.2mm
Base Plate	: 200mmX200mmX8mm
Top Plate	: 176mmX176mmX8mm

4.2 **Foundation:**

The CC foundation shall have to be designed on the basis of the weight of the structure with module and minimum wind speed of the site, i.e. 150 Km/hour. Normally, each MMS should be with minimum four legs grouted on pedestals of proper size. However, for sheds, CC work will not be required. The structure shall be grouted with fasteners with chemical sealing to withstand the required wind velocity. Angle of inclination shall be between 15^0 to 30^0, however, may be changed as per site requirement.

- CC Pillar size shall be : 300X300X250 mm
- For Pillars: Cement: Concrete: Sand Ratio :: 1:2:3
- Screws shall be Grouted in the Slab of roof up to depth of 50 mm.
- Lengths of rafter/Purlin may be changed as per site requirement.
- Sufficient numbers of vertical post shall be provided so that the structure may not bent.

5. SPECIFICATIONS FOR INVERTER /PCU:

As SPV array produce direct current electricity, it is necessary to convert this direct current into alternating current and adjust the voltage levels to match the grid voltage. Conversion shall be achieved using an electronic Inverter and the associated control and protection devices. All these components of the system are termed the “Inverter”. In addition, the inverter shall also house MPPT (Maximum Power Point Tracker), an interface between Solar PV array & the Inverter should also be DG set interactive, if necessary. Inverter output should be compatible with the grid frequency. Typical technical features of the inverter shall be as follows:

Specifications of Inverter	
Parameters	Detailed Specifications
Switching devices	IGBT
Capacity	The Rated Capacity of the Inverter shall not be less than the solar PV array capacity.
Control	Microprocessor /DSP
Nominal Voltage	230V/415V as the case may be
Voltage range	Single Phase: Shall work from 180 Volts to 270 Volts; Three Phase: Shall work from 180 Volts to 270 Volts per phase
Operating frequency/ range	50 Hz (47 to 52 Hz)
Grid Frequency Synchronization	± 3 Hz or more (shall also compatible for Synchronization with DG Set)
Waveform	Sine Wave
Harmonics	AC side total harmonic current distortion<5%
Ripple	DC voltage ripple content shall not be more than1%.

Efficiency	The inverters should be tested as per IEC standards/ as per latest MNRE Specification. The following criteria should be followed : The benchmarking efficiency criteria for the Grid tied (central/string/micro) inverter – At nominal voltage and full load is >95%, For load >25% is >92% The benchmarking efficiency criteria for the Grid tied PCU of capacity<5 kW:>85% And for capacity $\geq$ 5kW:90% For load >25% is >92% and No load losses should not be more than 5%. No load losses should not be more than 5%.
Losses	Maximum losses in sleep mode: 2W per 5kW Maximum losses in stand-by mode:10W
Casing protection levels	Degree of protection: Minimum IP-21 and 22 for indoor use and IP65 certification for outdoor use
Temperature	Should withstand from -10 to +50 deg. Celsius
Humidity	Should withstand up to 95% (relative humidity)
Operation	Completely automatic including wake up, synchronization (phase-locking) and shutdown
MPPT	Maximum power point tracker shall be integrated in the inverter to maximize energy drawn from the array. MPPT range must be suitable to individual array voltages in power packs
Protections	Mains Under / Over Voltage
	Overcurrent
	Over/Under grid frequency
	Over temperature
	Short circuit
	Lightening
	Surge voltage induced at output due to external source
	Anti Islanding (for grid synch. Mode)
	Battery under voltage and over voltage
System Monitoring Parameters	Inverter/PCU voltage & current Mains Voltage, Current & Frequency PV Voltage, Amps & KWH System Mimic & Faults
Recommended LCD Display on Front Panel	Accurate displays on the front panel:
	DC input voltage
	DC current
	AC Voltage (all 3 phases, in case of 3 phase)
	AC current (all 3 phases in case of 3 phase)
	Ambient temperature
	Instantaneous & cumulative output power

	Daily DC energy produced
	Battery voltage
Communication interface	RS 485 / RS 232 Inverter/PCU shall also house MPPT (Maximum Power Point Tracker), an interface between Solar PV array to the power conditioning unit/inverter should also be DG set interactive.
Power Factor	> 0.9
THD	<3%
Test Certificates	The inverter/PCU should be tested from the MNRE approved test centres / NABL /BIS /IEC accredited/15 authorized testing-calibration laboratories. In case of imported power conditioning units, these should be approved by international test houses.

a) Single/Three phase inverter shall be used with each power plant as per site requirement.

b) Total capacity of inverters/PCU shall not be less than the capacity of solar power plant.

c) Inverter/PCU shall be capable of complete automatic operation including wake-up, synchronization & shutdown.

d) The output of power factor of inverter/PCU is suitable for all voltage ranges or sink of reactive power, inverter should have internal protection arrangement against any sustainable fault in feeder line and against the lightning on feeder.

e) Built-in meter and data logger to monitor plant performance through external computer shall be provided (Providing Computer is not part of DNIT & is in the scope of user).

f) **Anti-islanding (Protection against Islanding of grid):** The inverter shall have anti islanding protection in conformity to IEEE 1547/UL 1741/ IEC 62116/IS16169 or equivalent BIS standard.

g) Successful Bidders/Supplier shall be responsible for galvanic isolation of solar roof top power plant (>100kWp) with electrical grid or LT panel.

h) The inverter generated harmonics, flicker, DC injection limits, Voltage Range, Frequency Range and Anti-Islanding measures at the point of connection to the utility services should follow the latest CEA (Technical Standards for Connectivity Distribution Generation Resources) Guidelines.

i) The inverter should comply with applicable IEC/ equivalent BIS standard for efficiency measurements and environmental tests as per standard codes IS/IEC 61683 and IEC 60068-2 (1,2,14,30)/ Equivalent BIS Std./EN50530,IEC 61727 (all clauses except clause 5.2.2). in case of clause 5.2.2, it should withstand the over/under frequency in the range 47 to 52 Hz.

j) The MPPT units environmental testing should qualify IEC 60068-2 (1, 2, 14, 30)/ Equivalent BIS std. The junction boxes/ enclosures should be IP 65 (for outdoor)/ IP 54 (indoor) and as per IEC 529 specifications.

6. BATTERY BANK

The battery bank should be Lithium Ferro Phosphate ($LiFePO_4$) having given capacity.

Sr. No.	Capacity	Battery Size
1	01 kWp	25.6V (Nominal)/100AH (equivalent to 2560 Wh)
2	02 kWp	25.6V (Nominal)/150AH (equivalent to 3840 Wh)
3	03 kWp	25.6V (Nominal)/200AH (equivalent to 5120 Wh)
4	04 kWp	48V (Nominal)/150AH (equivalent to 7200 Wh)
5	05 kWp	96V (Nominal)/100AH (equivalent to 9600Wh)
6	7.5 kWp	96V (Nominal)/150AH (equivalent to 14400 Wh)
7	10 kWp	96V (Nominal)/200AH (equivalent to 19200 Wh)

The other feature of battery should be:-

S.No.	Description	Specification
1.	Battery Type	$LiFePO_4$
2.	Working temperature range (both for charging & discharging)	20-60 Deg. C
3.	Minimum capacity of individual Cells	3.2V (Nominal), 20Ah, with 3C cell rating
4.	Type of Cell	Prismatic

Battery should have a certificate of testing as per tender requirement from any MNRE/BIS/NABL/IEC approved laboratory.

The Lithium Ferro Phosphate battery bank needs a very good “Battery Management System (BMS)” to ensure the proper charging and discharging of each cell of battery with proper protection of battery when temperature is reaching beyond battery permissible limits.

7. INTEGRATION OF PV POWER WITH GRID:

(i) The output power from SPV would be fed to the inverters/PCU which converts DC produced by SPV array to AC and feeds it into the main electricity grid after synchronization. In case of grid failure, or low or high voltage, solar PV system shall be out of synchronization and shall be disconnected from the grid. 4 pole isolation of inverter output with respect to the grid connection need to be provided. Solar Generation Meter(s) and bidirectional energy meter, as per HERC Net Metering Regulations should also be installed in the campus/building of beneficiary.

(ii) The solar generation meter and Bi-directional meter along with CT/PT (if required) with Surge Protection Device (SPD) should be of 0.2S accuracy class/ as per requirement of DISCOMs is in the scope of bidder. For LT connection the accuracy shall be as per requirement of DISCOMs.

(iii) CEA guideline 2013 (as amended from time to time) for interconnecting solar power with Grid shall be followed.

(iv) Certification of Islanding protection in the inverter from the manufacturer of the equipment shall be mandatory. This shall be arranged by the supplier from the manufacturer.

(v) Technical Standards for Interconnection:

S. No.	Parameters	Requirements	Reference
1.	Overall Conditions of Service	Reference to regulations	Conditions for Supply of Electricity of Distribution Licensees
2.	Overall Grid Standards	Reference to regulations	Central Electricity Authority (Grid Standards) Regulations 2010 and subsequent amendments
3.	Equipment	Applicable industry standards	IEC/BIS standards
4.	Safety and Supply	Reference to regulations, Chapter III (General Safety Requirements)	Central Electricity Authority (Measures of Safety and Electricity Supply) Regulations, 2010 and subsequent amendments
5.	Meters	Reference to regulations and additional conditions issued by the Commission.	Central Electricity Authority (Installation & Operation of Meters) regulations 2006 and subsequent amendments
6.	Harmonic Current	Harmonic current injections from a generating station shall not exceed the limits specified in IEEE 519	IEEE 519 relevant CEA (Technical Standards for Connectivity of the distributed generation resource) regulations 2013 and subsequent amendments
7.	Synchronization	Photovoltaic system must be equipped with a grid frequency synchronization device, if the system is using synchronizer inherently built into the inverter than no separate synchronizer is required.	Relevant CEA (Technical Standards for Connectivity of the distributed generation resources) regulations 2013 and subsequent amendments.
8.	Voltage	The voltage-operating window should minimize nuisance tripping and should be under operating range of 80% to 110% of the nominal connected voltage. Beyond a clearing time of 2 seconds, the Photovoltaic system must isolate itself from the grid.	
9.	Flicker	Operation of Photovoltaic system shouldn't cause voltage flicker in excess of the limits stated in IEC 61000 or other equivalent Indian standards, if any	Relevant CEA regulations 2013 and subsequent amendments if any, (Technical Standards for Connectivity of the distributed generation resource)
10.	Frequency	When the Distribution system frequency deviates outside the specified conditions (52 Hz on upper side and 47 Hz on lower side up to 0.2 sec), the Photovoltaic system shouldn't energize the grid and should shift to island mode.	
11.	DC Injection	Photovoltaic system should not	

		inject DC power more than 0.5% of full rated output at the interconnection point. Or 1% of rated inverter output current into distribution system under any operating conditions	
12.	Power Factor	While the output of the inverter is greater than 50%, a lagging power factor of greater than 0.9 shall be maintained	
13.	Islanding and Disconnection	The Photovoltaic system in the event of voltage or frequency variations must island/ disconnect itself within IEC standard on stipulated period	
14.	Overload and Overheat	The inverter should have the facility to automatically switch off in case of overload or overheating and should restart when normal conditions are restored	
15	Cable	For interconnecting Modules, Connecting modules and junction Boxes and junction boxes to inverter, DC copper cable of proper sizes shall be used. To connect inverter with AC panel aluminium cable of proper size shall be used. All the internal cables to be used in the systems shall be included in the cost while 100 mtr. AC aluminium cable of proper size to be used to connect inverter to AC panel shall be included in the cost of the system.	Relevant CEA regulations 2013 and subsequent if any, (Technical Standards for Connectivity of the distributed generation resource)

a) All switches and the circuit breakers, connectors should conform to IEC 60947, part I, II and III/ IS60947 part I, II and III.

b) The change-over switches, cabling work should be undertaken by the bidder as part of the project.

8. JUNCTION BOXES FOR CABLES FROM SOLAR ARRAY:

The junction boxes shall be made up of FRP (Hensel or equivalent make)/PP/ABS with dust, water and vermin proof. It should be provided with proper locking arrangements.

Series / Array Junction Box (SJB/AJB) (whichever is required): All the arrays of the modules shall be connected to DCCB. AJB shall have terminals of bus-bar arrangement of appropriate size Junction boxes shall have suitable cable entry with suitable glanding arrangement for both input and output cables. Suitable markings on the bus bars shall have to be provided to identify the bus bars etc. Suitable ferrules shall also have to be provided to identify interconnections. Every AJB should have suitable arrangement Reverse Blocking diode of suitable rating. Suitable SPD, suitable Isolation switches to isolate the DC input to Inverter has to be installed in AJB for protection purpose. Thus AJB should have DC isolator for disconnecting the arrays from inverter input. If in any case diodes, HRC Fuses, SPDs and isolators are installed in the string inverters, then

there is need to install these again in AJB. If some of these safety gadgets are not installed in String Inverter it should be installed in AJB. Cable interconnection arrangement shall be within conduit pipe on saddles installed properly. Cable connection should be done in such a manner that fault findings if any, can be identified easily. The cables should be connected in such a manner that clamp meter can be comfortably inserted around the individual cables to measure the data like current, voltage etc. AJB should also be marked as A1, A2, & so on. Wherever conduits are laid on wall/roof or ground, then it should be suitably laid in cable tray or appropriate civil structure which should be at least four inches above roof/ground level.

However, if the inverter is equipped with Junction Box, the cables may be connected directly to the ports provided in the inverter and no separate Junction Box is required.

9. PROTECTION & SAFETY:

Both AC & DC lines have suitable MCB/MCCB, Contractors, SPD, HRC Fuse etc. to allow safe start up and shut down before & after string inverter installed in the system. String inverters should have protections for overload, surge current, high Temperature, over/ under voltage and over/ under frequency & reverse polarity. The complete operation process & safety instructions should printed on the sticker & suitably pasted on the near inverters.
Inverter should have safety measures to protect inverter from reverse short circuit current due to lightening or line faults of distribution network.
Inverter should be suitably placed in covered area on a suitable platform or wall mounted or concrete platform (on rubber mat) with complete safety measure as per norms.

10. INVERTER/ARRAY SIZE RATIO:

- The combined wattage of all inverters should not be less than rated capacity of power plant under STC in KW.
- Maximum power point tracker shall be integrated in the inverter to maximize energy drawn from the array

11. AC COMBINER BOX BOARD (ACCB):

This shall consist of box shall consists of grid interphase panel of good quality FRP/ suitable powder coated metal casing. One Electronic Energy Meter (0.2S Class), ISI make, Three Phase duly tested by DISCOMs (Meter testing Division) with appropriate CT (if required), of good quality shall have to be installed at suitable placed to measure the power generated from SPV Power Plant, as per HERC Net Metering Regulations. Proper rating MCCB & HRC fuse and AC SPDs shall be installed to protect feeders from the short circuit current and surges as per the requirement of the site. Operation AC Isolator Switch of Grid Connectivity should be such that it can be switched ON or OFF without opening the ACCB.

12. CABLES/WIRE:

All cables should be of copper as per IS and should be of 650V/1.1 KV grade as per requirement. All connections should be properly made through suitable lug/terminal crimped with use of suitable proper cable glands. The size of cables/wires should be designed considering the line loses, maximum load on line, keeping voltage drop within permissible limit and other related factors. The cable/wire should be of ISI/ISO mark for overhead distribution. For normal configuration the minimum suggested sizes of cables are:

Module to module/AJB	4 sq mm (single core) DC Cable
AJBs to	• Up to capacity of 10 kWp Solar Plant, minimum 4 sq mm (Single/Double core) DC Cable, with respect to current ratings of

MJB/DCCB/Inverter	designing • For capacity more than 10 kWp & up to 20 kWp Solar Plant, minimum 6 sq mm (Single/Double core) DC Cable, with respect to current ratings of designing • For capacity more than 20 kWp Solar Plant, minimum 10 sq mm (Single/Double core) DC Cable, with respect to current ratings of designing
Inverter to ACCB/Distribution board	AC Cable as per design & rating

The size & rating of the cables may vary depending on the design & capacity of SPV Power Plant.

All DC cables shall be as per IS 17293:2020 as per applicability.

13. CABLE TRAY:

All the cables should be laid in appropriate GI cable tray as per the requirement of the site, No cable should be laid directly on ground and cable tray should be laid for any wire on ground such that there is gap of at least two inches above ground.

14. DISPLAY BOARD:

The bidder has to display a board at the project site mentioning the following:

- Plant Name, Capacity, Location, Type of Renewable Energy plant (solar), Date of commissioning, details of tie-up with transmission and distribution companies, Power generation and Export FY wise.
- Financial Assistance details from DNRE/MNRE/Any other financial institution apart from loan. This information shall not be limited to project site but also be displayed at site offices/head quarter offices of the successful bidder
- The size and type of board and display shall be approved by Engineer-in-charge before site inspection.
- **DANGER BOARDS**: Danger boards should be provided as and where necessary as per IE Act. /IE rules as amended up to date.

15. MANUAL DISCONNECTION SWITCH:

It should be provided to isolate the system from Grid which should be outside of ACCB.

16. AC DISTRIBUTION PANEL BOARD:

a) AC Distribution Panel Board (DPB) shall control the AC power from inverter, and should have necessary surge arrestors. Interconnection from ACDB to mains at LT Bus bar wfhile in grid tied mode.

b) All switches and the circuit breakers, connectors should conform to IEC 60947, part I, II and III/ IS60947 part I, II and III.

c) The changeover switches, cabling work should be undertaken by the bidder as part of the project.

d) All the Panel's shall be metal clad, totally enclosed, rigid, floor mounted, air – insulated, cubical type suitable for operation on three phase / single phase, 415 or 230 volts, 50 Hz

e) The panels shall be designed for minimum expected ambient temperature of 45 degree Celsius, 80 percent humidity and dusty weather.

f) All indoor panels will have protection of IP54 or better. All outdoor panels will have

protection of IP65 or better.

g) Should conform to Indian Electricity Act and rules (till last amendment).

h) All the 415 AC or 230 volts devices / equipment like bus support insulators, circuit breakers, SPDs, VTs etc., mounted inside the switchgear shall be suitable for continuous operation and satisfactory performance under the following supply conditions.

Variation in supply voltage	+/- 10 %
Variation in supply frequency	+/- 3 Hz

17. DATA ACQUISITION SYSTEM / PLANT MONITORING:

I. The Department of New & Renewable Energy & HAREDA will have a common State Level Solar Energy Data Management platform for monitoring of operation and performance of Roof Top Solar Plants installed.

II. Remote Monitoring System (RMS) provided by all bidders should connect to State Level Solar Energy Data Management platform.

III. Remote Monitoring System (RMS) should have following minimum features or modules:

Feature	Details
Solar System Performance Parameters	DC Voltage, DC current, AC output Current, Power, Energy, Inverter Status etc.
RMS device Performance	%Device Connectivity, %Data Availability etc.
Geo Location	RMS shall have built in GPS module to update Geo Location of system

IV. **Communication Architecture between SEDM and RMS should be as per following:**

A. Communication Connectivity:

i. **Field Device Connectivity:** RMS communication with Inverter should be on RS485 MODBUS RTU protocol to ensure interoperability irrespective of make and manufacturer

ii. **Remote Connectivity:** Using GSM/GPRS/2G/3G/4G cellular connectivity through SIM Card, cost of SIM card has to be borne by bidder in entire duration of the contract

iii. **Local Connectivity:** Ethernet/Bluetooth/Wi-Fi connectivity to configure parameters, notifications, communication interval, set points etc. or to retrieve locally stored data

iv. **Sensor Connectivity:** RMS shall have provision for 04 Analog with 0.1% accuracy to address the requirement of local sensors connectivity if required by SIA for applications such as irradiation, temperature etc.

B. Communication Modes:

i. Push Data on Event/Notification: Inverter ON/OFF, Inverter fault, protection operated etc.

ii. Push Data Periodically: important parameters of Inverter and Energy Meters (as mentioned in tender) should be pushed to central server on

configurable interval. Interval should be configurable in multiple of 1 minute.

iii. Command On Demand: It should be possible to send commands via GSM or GPRS to RMS either to control Inverter operations or to update configuration

C. Communication Protocol:

RMS should provide data on MQTT Protocol to establish communication with thousands of systems.

D. Security:

Communication between RMS and Server should be secured and encrypted using TLS/SSL/X.509 certificate etc.

As a part of IoT protocol, Authentication and Authorization should be implemented using token/password mechanism

E. Message Format:

RMS should provide data in a JSON message format as per Communication Architecture Guideline requirement

F. Data Storage:

In case of unavailability of cellular network, RMS should store data locally and on availability of network it should push data to central server. Local data storage should be possible for at least one year in case of unavailability of cellular network.

G. Configuration Update Over-The-Air:

Configuration update over the air of multiple parameters such as IP, APN, Data Logging Interval, Set Points etc. is essential.

18. PRIORITY FOR POWER CONSUMPTION:

Regarding the generated power consumption, in case of string inverter, priority need to given for internal consumption first and thereafter any excess power can be exported to grid.

19. PROTECTIONS

The system should be provided with all necessary protections like earthing, Lightening, and grid anti- islanding as follows:

(i) **Lightening and Over Voltage Protection:**

The SPV Power Plant shall be provided with lightening and over voltage protection. The principal aim in this protection is to reduce the over voltage to a tolerable value before it reaches the PV or other sub-systems components. The source of over voltage can be lightening or any other atmospheric disturbance. The Lighting Arrestor (LA) is to be made of 1¼" diameter (minimum) and 12 feet long GI spike on the basis of the necessary meteorological data of the location of the projects. Necessary foundation for holding the LA is to be arranged keeping in view the wind speed of the site and flexibility in maintenance in future. Each LA shall have to be earthed through suitable size earth bus with earth pits. The earthing pit shall have to be made as per IS 3043. LA shall be installed to protect the array field, all machines and control panels installed in the control rooms. Number of LA shall vary with the capacity of SPV Power Plant & location.

Number of LA should be in such a manner that total layout of solar modules should the effective coverage of LA's.

The lightening arrester shall be of Early Streamer Emission (ESE) type.

(ii) **Earthing Protection:**

Each array structure of the PV yard shall be grounded properly. In each array every module should be connected to each other with copper wires, lug teethed washers addition the lightening arrestor/masts shall also be provided inside the array field. Provision shall be kept for shorting and grounding of the PV array at the time of maintenance work. All metal casing/shielding of the plant shall be thoroughly grounded in accordance with Indian Electricity Act/IE rules as amended up to date. The earthing pit shall be made as per IS: 3043. All the array structures and equipments/control systems shall be compulsorily connected to the earth, separately. Number of earthling shall vary with the capacity of SPV Power Plant & location. G.I. /Copper strips should be used for earthling instead of G.I. wires, LA should be installed to protect the array field & machines installed in the control rooms. Number of LA shall vary with the capacity of SPV Power Plant & location. Earth resistance shall not be more than 5 ohms.

(iii) **Surge Protection:**

Internal surge protection shall consist of three MOV type surge-arrestors connected from +ve and –ve terminals to earth (via Y arrangement)

(iv) **Grid Islanding:**

a. In the event of a power failure on the electric grid, it is required that any independent power-producing inverters attached to the grid turn off in a short period of time. This prevents the DC-to-AC inverters from continuing to feed power into small sections of the grid, known as "islands."

   Powered islands present a risk to workers who may expect the area to be unpowered, and they may also damage grid-tied equipment. The Rooftop PV system shall be equipped with islanding protection. In addition to disconnection from the grid (due to islanding protection) disconnection due to under and over voltage conditions shall also be provided.

b. A manual disconnect pole isolation switch beside automatic disconnection to grid would have to be provided at utility end to isolate the grid connection by the utility personnel to carry out any maintenance. This switch shall be locked, if required, by the utility personnel

20. CONNECTIVITY:

The user have to take approval/NOC from the Concerned DISCOM for the connectivity, technical feasibility, and synchronization of SPV plant with distribution network before commissioning of SPV plant, however the supplier have to extend all technical help to the user for preparing the documents required for getting the above clearance from DISCOMs.
Reverse power relay shall be provided by bidder (if necessary), as per the local DISCOM requirement.
The maximum capacity for interconnection with the grid at a specific voltage level shall be as specified in the Distribution Code/Supply Code and amended from time to time. Connecting voltage shall be three phase or as per site requirement based on the

availability of grid level and as per DISCOM. DISCOMS may be consulted before finalization of the voltage level and system shall be designed accordingly.

21. DRAWINGS & MANUALS:

(i) Two sets 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 along with protection equipment.

(ii) Approved BISI and reputed makes for equipment be used.

22. SAFETY MEASURES:

The bidder shall take entire responsibility for electrical safety of the installation(s) including connectivity with the grid and follow all the safety rules & regulations applicable as per Electricity Act, 2003 and CEA guidelines etc. All work shall be carried out in accordance with the latest edition of the Indian Electricity Act and rules formed there under and as amended from time to time.

23. CODES AND STANDARDS:

The quality of equipment supplied shall be controlled to meet the guidelines for engineering design included in the standards and codes listed in the relevant ISI and other standards, such as :

i. IEEE 928 Recommended Criteria for Terrestrial PV Power Systems.
ii. IEEE 929 Recommended Practice for Utility Interface of Residential and Intermediate PV Systems.
iii. IEEE 519 Guide for Harmonic Control and Reactive Compensation of Static Power Controllers.
iv. National Electrical NEPA 70-(USA) or equivalent national standard.
v. National Electrical Safety Code ANSI C2- (USA) or equivalent national standard.
vi. JRC Specification 503 (Version 2.2 March 1991) or JPL Block V standard for PV modules.
vii. The inverter manufacturer should attach efficiency certificate from Independent Third Party Testing laboratory i.e. IEC, TUV, SNL/ERTL & STQC. Inverter should confirm to IEC 61683 for efficiency measurements and IEC 60068 2 for environmental testing. MPPT unit should confirm to design qualification IEC 62093.
viii. IEC 62116 for Anti Islanding
ix. IEC 62109-1, IEC 62109-2 for safety
x. IEC 61727 FOR UTILITY INTERFACE.
xi. IS16221 Part II,

Any left out specification shall be as per the latest BIS/MNRE/IEC or any other equivalent National standard/specifications.

NOTE:
The bidder may offer any other make of Module/Battery/Inverter subject to submission of compatibility certificate with the make(s) offered in the bid issued by MNRE/NABL accredited laboratory.

Annexure-IA

Technical Bid format/ Index for the Technical Bid documents

Sr. No.	Name of Document	Status of Submission (Yes/No)	Page Number as per numbering given to the technical bid documents uploaded on the portal
1	Submission of online payments i.e Earnest Money Deposit, Tender Document Fee & e - Service Fee and scanned copies of supporting documents.	Yes/ No	
2	All the documents submitted by the bidder as part of its Technical Bid are attested by the signing authority of the bidder.	Yes/ No	
3	An undertaking by the bidding firm in reference to acceptance of all the terms & conditions of the Schedule-A/ DNIT.	Yes/ No	
4	Submit a signed copy of DNIT.	Yes/ No	
5	The Bidder is either a body incorporated in India under the Companies Act, 1956 or 2013 including any amendment thereto or proprietary/partnership/LLP firm. Submit a copy of certificate of incorporation.	Yes/ No	
6	Is bidder system integrator, Tie-up certificate of other major items from original manufacturer.	Yes/ No	
7	Bidder should have not been debarred/ blacklisted by any Govt. Deptt's / organization/ PSU's / institutions/ agencies/ autonomous Organizations. Submit an Affidavit on non-judicial stamp paper duly attested by the notary stating that the bidder has not been blacklisted/debarred by any Govt. Deptt's / organization/ PSU's / institutions/ agencies/ autonomous Organizations.	Yes/ No	
8	The Bidder should have valid GST registration certificate of the billing state. Submit a copy of GST no and PAN no.	Yes/ No	
9	The bidder should have desired minimum average annual turnover of the total estimated value of quoted capacity in the last three years, ending 31st March of Financial Year **2025-26**. *Submit the annual Turnover Certificate in given format **(Performa-I)** duly certified by CA.*	Yes/ No	
10	The bidders are requested to enclose the proof of completion of the required capacity projects duly certified by SNA/any Government agency.) *Similar & relevant works/rate contract means: Supply, Installation & Commissioning of Grid Connected Rooftop Solar Power Plants or Ground Mounted Solar Power Plants.* **Submit only Commissioning Certificates**	Yes/ No	

	certified by SNA or any Government agency supporting the claim. Bidders shall not upload the work orders.		
11	General Particulars of the bidder in **Performa II.**	Yes/ No	
12	The make of major components of the system i.e. Solar module, inverter/PCU, battery should be mentioned. Tie up certificates in **Performa-III** may be submitted.	Yes/ No	
13	If manufacturer claims the MSME then the test report of solar module, battery cell, Inverter or solar cell, as the case may be, in the name of bidder shall be provided with the bid.	Yes/ No	
14	Commissioning Certificates certified by SNA or any Government agency supporting the claim of experience.	Yes/ No	
15	If, bidder is system integrator, the undertaking of Manufacturer of major item (**Performa IV**) shall be provided.	Yes/ No/ NA	
16	Net worth certificate (**Performa -V**)		

PERFORMA-I

INFORMATION IN SUPPORT OF MEETING ESSENTIAL ELIGIBILITY CONDITIONS REGARDING AVERAGE ANNUAL TURNOVER OF THE BIDDER IN LAST THREE FINANCIAL YEAR ENDING 31.3.2026

Annual turnover of the bidder in last three financial year:

Name of Bidder:

Annual turnover data for last three years ending on **31st March 2026**			
S.No.	Year	Turnover (Rs. in Lacs)	Turnover Rupees in words
1.	2023-24		
2.	2024-25		
3.	2025-26		
4.	Average turnover in last three years ending on **31st March 2026** =(1+2+3)/3		

Signature with seal of bidder
Dated:

Signature of Charted Accountant with seal

Name _____

Name of CA Company: _____

M.No. _____

Note:

1. *Bidder must complete the information in this form.*
2. *The information provided shall be certified by Chartered Accountant.*

PERFORMA-II

GENERAL PARTICULARS OF BIDDER

Bid for Design, Supply, Erection, Testing & Commissioning of Grid Connected Rooftop Solar Power Plants, including comprehensive maintenance for a period of 07 years including supply of bi directional meter, in the Haryana.

1.	Name of firm	
2.	Postal Address	
3.	Telephone/Telex,/FaxNo	
4.	E-mail	
5.	Website	
6.	**Category of Bidder/** Company incorporated in India under the Companies Act, 1956 or 2013 including any amendment thereto or proprietary/partnership firm/LLP firm *A copy of certificate of incorporation shall be furnished along with the bid in support of above.*	
7.	Whether, the bidder (**manufacturer of *solar module/inverter/PCU/solar cell/LiFePO$_4$ battery cells* in Haryana**) is any one of the following : (i) Manufacturing Micro & Small Enterprises (including Khadi & Village Industries) or (ii) Manufacturing Medium Enterprises (including Khadi & Village Industries) *If, the bidder Manufacturing Small & Medium Enterprises (including Khadi & Village Industries) or Manufacturing Micro Enterprises (including Khadi & Village Industries), then please mention the device/item (**solar module/inverter/PCU/ solar cell/ LiFePO$_4$ battery cells**) for which it is registered in Haryana. A copy of certificate of Entrepreneurs Memorandum/UDYOG AADHAR issued by Industry Department, Haryana should be furnished along with the bid in support of above.*	
7.1	Quality Certification of ISI/ISO/ AgMark/ Quality mark issued form competent	

	authority in State or Central Govt. in respect of the items/goods mentioned in the tender (Provide the required certification No. and upload the certificate with the bid).	
7.2	Is the bidder registered with DGS&D/ NSIC/ GOI Department/ State Govt. Department/ GOI PSUs/ State Govt. PSUs in respect of the items/goods mentioned in the tender. (Yes/No, if yes, upload the certificate with the bid)	
8.	Name of Directors of Company (at least Two directors with email IDs & contact Numbers)	(i) …….. (ii) ……..
9.	Name & designation of the authorized signatory to whom reference shall be made	
10.	Present activities/business of the firm i. Solar Module/Cell Manufacturer ii. Inverter Manufacturer iii. Battery Cell Manufacturer iv. System Integrator	
11.	Registration number	
	GST No.	
	PAN	
	TAN	
12.	Place & State of billing	
13.	Have the contractor/ firm to pay arrears of income tax? If yes up to what amount?	
14.	Have the contractor/ firm/firms having common director ever been debarred by any Govt. Deptt. /Public Sector Undertakings for undertaking any work?	
15.	Monthly capacity of supply, installation & commissioning of the systems.	
16.	Bid offered for Capacity (**Bidder has to bid for full capacity**)	…… kWp
17.	Average annual turnover of the bidder for the last three years (Rs. in Lakh)	
18.	The bidder have positive net worth in the previous Financial Year. (Yes/No)	
19.	Experience of the bidder in terms of capacity installed in kWp (verified by any Govt. department/organisation)	------kWp
20.	*Make(s) of Modules offered for the system: (Upload Tie up certificates)*	i. ……, ii. …… iii. ……

		iv. ……. v. …….
21.	*Make(s) of Inverters/PCU offered for the system:* *(Upload Tie up certificates)*	i. ……, ii. …… iii. …… iv. ……. v. …….
22.	*Make(s) of Battery offered for the system:* *(Upload Tie up certificates)*	i. ……, ii. …… iii. …… iv. ……. v. ……
23.	Name of the any close/near relative of any employee/ office bearer/management of bidder company working in New & Renewable Energy Department, Haryana or HAREDA	Name Designation Place of Posting Relationship
24.	Any Other Information	

We solemnly declare that we are aware of binding provisions of the ALMM Order of MNRE and the List(s) thereunder.

We solemnly declare that we will abide by any penal action such as disqualification or black listing or termination of contract or any other action deemed fit, taken by, the Nodal agency against us, if it is found that the information, statements, documents, certificates produced by us are false / fabricated or any information is concealed therein.

Date **(Signature of Bidder)**
With SEAL

PERFORMA-III

TIE UP CERTIFICATE

(from Manufacturer on the letter head of the manufacturer)

We undertake to supply _____(inverters/PCU/Battery/indigenously manufactured modules), confirming the specifications as per DNIT/tender no. …….. Invited by Supplies & Disposals Department Haryana to the ……. ……..…… (name of bidder) for NRE/HAREDA requirement as and when ordered by the bidder.

Dated:

Authorised Signatory
(with Seal)

PERFORMA-IV

UNDERTAKING BY MANUFACTURER OF PV MODULE/INVERTER/PCU/BATTERY
(on Non Judicial Stamp Paper of Rs. 10/-)

I ——————————————(Name of Authorised person) _____ (designation in the manufacturer company) on behalf of M/s. ——————————————— ——————————————————— (Manufacturer of Solar Module/ /Inverter/PCU/battery), A company incorporated under the Companies Act, 1956, having its registered office at ——————————————————————————————— ——-and Factory at ——————————— (hereafter called the Company) has given the undertaking as under:

1. M/s. ——————————————————————————— (System Integrator) Represented by ——————————————————— A company incorporated under the Companies Act, 1956, having its registered office at —— ——————————————————— (hereafter called the system integrator) is hereby authorized to install the product /device…. …… (Solar Module/Inverter/Battery) manufactured by the Company, in the State of Haryana in reference to the tender no. ……..…. invited by DGS& D Haryana for New & Renewable Energy Department/HAREDA for supply and installation of the GCRT Solar Power Plant, if name of System Integrator is finalized in the rate contract and orders are received.
2. In case System Integrator defaults at any stage of execution of warrantee/guarantee/CMC and after sale service of the said device, installed in reference to rate contract of the said tender, then the Company will be responsible to execute the warrantee/guarantee/CMC of the product/device …….. (Solar Module/Inverter/Battery) supplied by us at site of installation as per the terms and conditions of rate contract/DNIT of the above tender.
3. In case System Integrator defaults, the Company will adhere the directions of the New & Renewable Energy Department/HAREDA directly.

DATED:

Sign.: ……
Name of Authorised person: ……
Designation of Auth. Person: ……
Name of Manufacturer Company ……
With seal

PERFORMA-V

NET WORTH (FINANCIAL CAPABILITY)

Name of bidder

Financial information in Rs. Lakhs	Actual: For financial year **2023-24** (Rs. In Lakhs)	Actual: For financial year **2024-25** (Rs. In Lakhs)	Actual: For financial year **2025-26** (Rs. In Lakhs)
Total assets			
Current assets			
Total liabilities			
Current liabilities			
Profits before taxes			
Profits after taxes			
Net worth (Paid up share capital + reserves & surplus)			
Average **Net worth** for last Three Years			
Net worth is Positive or Negative			

It is certified that the bidder not suffered losses for any reasons whatsoever in last three Financial Years.

Signature with seal of bidder

Signature with seal of Chartered Accountant
Name:
M.No**.**

1. Bidder must fill in the form.

2. The statement of Net Worth is to be certified by a Chartered Accountant.