

Ref:- TSREDCO/SE/5MW/RESCO/RC/SPV1-1000KWp/2018-19,Dt:24.09.2018

(E-Procurement Tender Notice)

**EMPANELMENT AND IMPELEMENTATION OF 5MW CAPACITY GRID
CONNECTED SOLAR POWER PLANTS AT VARIOUS GOVT. BUILDINGS IN
TELANGANA STATE THROUGH RATE CONTRACT PROGRAMME**

**UNDER
RESCO MODE**

CLOSING DATE : 08.10.2018 AT 3.00 PM



**TELANGANA STATE RENEWABLE ENERGY DEVELOPMENT CORPORATION LTD
(TSREDCO)**

Corporate Office: D. No. 6-2-910, Visvesvaraya Bhavan,
The Institution of Engineers Building, Khairatabad, Hyderabad - 500 004.
Telangana State, India

PHONE: 040-23201502, 23201503, FAX : 040-23201504

E-mail : info@tsredco.telangana.gov.in, se@tsredco.telangana.gov.in

website: www.tsredco.telangana.gov.in

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Website advertisement
Tender Notice



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DEVELOPMENT CORPORATION LTD
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Online tenders are hereby invited from interested and eligible bidders for "Design, Supply, Installation, Testing and Commissioning of 1-1000KWp Roof top Model various capacities of Solar Photo Voltaic Power Plants for aggregated 5MW capacity under net-metering scheme at **various Govt. Buildings in Telangana State under RESCO Mode**

Interested bidders can download the bids online from 26.09.2018 and submit the same, from 30.09.2018 to 08.10.2018 till 03:00PM through www.tender.telangana.gov.in. For further details please visit our website: www.tsredco.telangana.gov.in

Date:24.09.2018

Sd/-
VC & MD,
TS REDCO

TENDER SCHEDULE

TSREDCO invites sealed tenders comprising Pre-qualification, technical bid and price bid from the eligible bidders for Design, Supply, Installation, Testing and Commissioning of 1-1000KWp Roof top Model various capacities of Solar Photo Voltaic Power Plants for aggregated 5MW capacity under Net-metering Scheme with Five Years of Comprehensive Maintenance Contract at **various Govt. Buildings in Telangana State under RESCO Mode.**

SECTION – A**Time schedule of various tender related events**

Bid calling date	24.09.2018
Bid Document fee (Nonrefundable)	Rs. 29,500/- (By way of DD from any Scheduled Bank in favour of TS REDCO, payable at Hyderabad)
Bid Documents Downloading Start date	26.09.2018
Pre-Bid Conference	29.09.2018 at 11.00AM in TSREDCO, D. No. 6-2-910, Visvesvaraya Bhavan, The Institution of Engineers Building, Khairatabad, Hyderabad, 500 004. Telangana State, India
Bid Document Downloading End Date	08.10.2018 till 03.00 PM
Last date for uploading of online documents	08.10.2018 till 03.30 PM
Last date for submission of Hard copies of documents uploaded online	11.10.2018 till 05.00 PM at TSREDCO, D. No. 6-2-910, Visvesvaraya Bhavan, The Institution of Engineers Building, Khairatabad, Hyderabad, 500 004. Telangana State, India
Pre-qualification & Technical Bid opening date/time	12.10.2018 at 03:00 PM.
Price Bid opening date/time	16.10.2018 at 04:00 PM
Contact person	General Manager, TSREDCO, Hyderabad
Reference No	TSREDCO/SE/5MW/RESCO/RC/SPV1-1000KWp/2018-19/ Dt:24.09.2018

VC & MD
TS REDCO

CLARIFICATIONS:

- i. Queries if any, can be made through e-mail only on se@tsredco.telangana.gov.in on or before **05.10.2018**. Queries received via any mode other than e-mail id mentioned above will not be entertained. The queries should only be sent in following format on the official letter head of the company.

S.No.	Page No. (Tender Ref.)	Clause (Tender Ref.)	Description (Tender Ref.)	Query

- ii. The addendum/corrigendum if any shall be published on TSREDCO's website i.e. www.tsredco.telangana.gov.in as well as on e-procurement platform www.tender.telangana.gov.in.
- iii. The Bidders are requested to submit the bids after issue of clarifications duly considering the changes made if any. Bidders are totally responsible for incorporating/complying the changes/ amendments issued if any in their bid.

VC & MD
TSREDCO

SECTION-B
STATEMENT OF IMPORTANT LIMITS/VALUES RELATED TO BID

Item	Description
Bid Document fee (Nonrefundable)	Rs. 29,500/- (By way of DD from any Scheduled Bank in favour of TS REDCO, payable at Hyderabad)
Name of the Work	Empanelment and Implementation of aggregated 5MW capacity for Supply, Installation, Commissioning maintenance and operation of Grid connected Solar PV power plants of 1 to 1000 kWp capacity at various Govt. Buildings in the State of Telangana under of Net Metering Policy & RESCO mode for MNRE Sanctions through Rate Contract Prog. 1. 318/53/2018-GCRT, Dated.06.09.2018 – 15MW for Govt. Buildings
Minimum Eligibility Criteria	Any Developer who qualifies the Financial criteria can submit the bid. However the execution of the project should be carried only by a Registered SPV Suppliers/ Manufacturers/ System Integrators empaneled with TSREDCO in the Year 2018-19 with requisite experience of at least minimum 200KWp cumulative capacity in field of Off Grid OR Grid Connected Solar PV systems in any one (1) year from the last 3 Years (i.e. FY 2015-16, 2016-17 and 2017-18) anywhere in Telangana State.
Minimum Eligibility Financial Criteria	The bidder shall submit the Solvency certificates from banks etc.) of not less than Rs. 2.50 crores for each 0.50 MW capacity
EMD / Bid Security	Rs. 2,00,000/- by way of Demand Draft in favour of TSREDCO, payable at Hyderabad or equivalent amount of Bank Guarantee from a nationalized/ scheduled bank. Firms claiming Exemptions for EMD shall submit letter from NSIC/ SSI for particular tender
Bid Validity Period & offer for acceptance	90 days from the date of opening of commercial bid
Period of Rate Contract	Valid for one Year from the date of finalization
Security validity period	At the time of allocation of projects, the bidder shall submit Performance Guarantee of Rs.7,50,000/- for each 500 KWp system on proportionate basis for the total capacity allotted to take up the project under RESCO MODE. This Performance Guarantee amount shall be submitted in the form of DD in favour of “TSREDCO, Hyderabad” OR Bank guarantee of Rs. 15,00,000/- from any nationalized/scheduled bank. The bank guarantee should be valid for a period of one year OR Completion date of the project whichever is earlier from the date of allocation of project. No interest shall be paid by TSREDCO on the amount of security money deposit.
Transaction Fee	Transaction fee: All the participating bidders who submit the bids have to pay an amount @ 0.03% of their final bid value online with a cap of Rs. 10,000/- for quoted value of purchase up to Rs.50 crores and Rs.25000/- if the purchase value is above Rs.50 crores & GST applicable as levied by Govt.

	of India on transaction fee through online in favour of MD, TSTS. The amount payable to TSTS is nonrefundable.
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Note:

1. The Tender document can be downloaded from <http://www.tsredco.telangana.gov.in> and the cost of tender document should be enclosed by way of Demand Draft of Rs. 25,000/- Plus 18% GST making in total amount of Rs.29,500/- in favour of TSREDCO, payable at Hyderabad and this D.D. is to be inserted in the technical bid of the tender document.
2. In respect of Minimum eligibility criteria (above), relevant attested copies of approvals of MNRE/TSREDCO shall be submitted along with Technical bid.
3. All relevant required documents along with evidences are to be inserted in technical bid, and only quoted rates (as per Format enclosed) is to be inserted in the financial bid.
4. Financial bid will be opened of those bidders who would duly qualify in the technical bid.

1.0. DEFINITIONS & ABBREVIATIONS:

In this “Bid / RFS Document” the following words and expression will have the meaning as herein defined where the context so admits:

1.1. “Affiliate” shall mean a company that either directly or indirectly

12. controls or

13. is controlled by or

14. is under common control with

A Bidding Company and “control” means ownership by one company of at least fifty one percent (51%) of the voting rights of the other company.

1.2. “Benchmark Cost” shall mean per Wp cost defined by MNRE for solar power plants without battery. For the purpose of this RFS, the benchmark cost will be considered as Rs. 60/Wp for 1-10KWp, Rs. 55/Wp for 11-100KWp and Rs. 53/Wp for above 100KWp

1.3. "B.I.S" shall mean specifications of Bureau of Indian Standards (BIS);

1.4. “Bid/Tender” shall mean the Techno Commercial and Price Bid submitted by the Bidder along with all documents/ credentials/ attachments/ annexure etc., in response to this RFS, in accordance with the terms and conditions hereof.

1.5. “Bidder/Bidding Company” shall mean Bidding Company submitting the Bid. Any reference to the Bidder includes Bidding Company/ including its successors, executors and permitted assigns as the context may require”;

- 1.6. “Bid Bond” shall mean the unconditional and irrevocable bank guarantee to be submitted along with the Bid by the Bidder under Clause 3.11 of this RFS, in the prescribed Format- 3;
- 1.7. “Bid Deadline” shall mean the last date and time for submission of Bid in response to this RFS as specified in Bid Information Sheet;
- 1.8. “Bid Capacity” shall mean capacity offered by the bidder in his Bid under invitation.
- 1.9. “CEA” shall mean Central Electricity Authority.
- 1.10. “Chartered Accountant” shall mean a person practicing in India or a firm whereof all the partners practicing in India as a Chartered Accountant(s) within the meaning of the Chartered Accountants Act, 1949;
- 1.11. “Competent Authority” shall mean Vice Chairman & Managing Director (VC & MD) of **Telangana State Renewable Energy Development Corporation Ltd** himself and/or a person or group of persons nominated by VC & MD for the mentioned purpose herein;
- 1.12. “Commissioning” means Successful operation of the Project / Works by the Contractor, for the purpose of carrying out Performance Test(s) as defined in RFS.
- 1.13. “Company” shall mean a body incorporated in India under the Companies Act, 1956 or Companies Act, 2013 including any amendment thereto.
- 1.14. “Capacity Utilization Factor” (CUF) means the ratio of the actual output from a solar plant over the year (kWh) to the maximum possible output from it for a year (kWh) under ideal conditions.
 - 1.14.1. $CUF = \frac{\text{Actual Plant Output in kWh over the year}}{\text{Installed Plant Capacity in kW} \times 365 \times 24}$.
 - 1.14.2. Monthly CUF: $\frac{\text{Monthly Plant out in kWh}}{\text{installed plant capacity in kW} \times \text{number of days in a month} \times 24}$.
- 1.15. “Eligibility Criteria” shall mean the Eligibility Criteria as set forth in Clause 4.0 of this RFS;
- 1.16. “Financially Evaluated Entity” shall mean the company which has been evaluated for the satisfaction of the Financial Eligibility Criteria set forth in Clause 4.0 hereof;
- 1.17. "IEC" shall mean specifications of International Electro-Technical Commission;
- 1.18. "kWp" shall mean Kilo-Watt Peak;
- 1.19. "kWh" shall mean Kilo-Watt-hour;

- 1.20. "MNRE" shall mean Ministry of New and Renewable Energy, Government of India;
- 1.21. "Maximum Bid/Tender Capacity" shall mean 2MWp under RESCO MODE which is the maximum aggregate capacity for which the Bidder can submit its Bid.
- 1.22. "Minimum Bid/Tender Capacity" shall mean 500 kWp RESCO MODE which is the minimum aggregate capacity for which the Bidder can submit its Bid.
- 1.23. "MODE" shall mean RESCO MODE which includes energy sale which shall not exceed beyond the levelized ceiling tariff as referred in clause no. 2.
- 1.24. "Net-worth" shall means as per Company Act 2013 and Amendment, if any.
- 1.25. "O&M" shall mean Operation & Maintenance 25 years for RESCO MODE of Rooftop Solar PV system;
- 1.26. "Owner of project" shall mean the Successful bidder who has taken the roof on mutually agreed terms and conditions from the roof top owner(s) and enters into a PPA with the consumer(s) for supply of solar power for 25 years from the date of Commissioning of project.
- 1.27. "Levelized Tariff" shall mean the tariff offered by the Bidder for 25 years for the Scope of work as per RFS document subject to the maximum levelized tariff of 25 years of as per clause 2
- 1.28. "Project capacity" means Capacity in kWp allocated to the Bidder for consisting of single or multiple roof tops. The project capacity specified is on "DC" output Side only.
- 1.29. "Performance Ratio" (PR) means
- "Performance Ratio" (PR) means the ratio of plant output versus installed plant capacity at any instance with respect to the radiation measured.

$$PR = \frac{\text{Measured output in kW}}{\text{Installed Plant capacity in kW}} \times \frac{1000 \text{ W/m}^2}{\text{Measured radiation intensity in W/m}^2}$$

- 1.30. "Project Sanction Documents" shall mean the documents as specified in Annexure - A
- 1.31. "Price Bid" shall mean Envelope III of the Bid, containing the Bidder's quoted Price as per the Section- IV of this RFS;
- 1.32. "Qualified Bidder" shall mean the Bidder(s) who, after evaluation of their Techno Commercial Bid as per Clause 4.0 of Section-I stand qualified for opening and evaluation of their Price Bid;

- 1.33. "RFS" shall mean Request for Selection (RFS)/ Bid document/ Tender document
- 1.34. "RESCO" shall mean Renewable Energy Service Companies
- 1.35. "RESCO MODE" shall mean where the bidders intend to take a rooftop owned by some other entity on mutually agreed terms and conditions including lease agreement from the roof top owner(s) and enters into the PPA with rooftop owner / DISCOM / others for supply of Solar power for 25 years at a tariff as per RFS from the date of Commissioning of project.
- 1.36. "Rooftop Solar PV" shall mean solar PV array/system installed on the flat /inclined roof of the building / elevated platform on metallic or concrete structure minimum 10 feet above ground level / Ground mounted system (in the places where sufficient shadow free rooftop area is not available.) In such instance up to 40% Solar PV array/system capacity can be accommodated on nearby unutilized land subject to the TSREDCO's approval.
- 1.37. "Statutory Auditor" shall mean the auditor of a Company appointed under the provisions of the Companies Act, 1956 / 2013 or under the provisions of any other applicable governing law;
- 1.38. "Successful Bidder(s)/ Contractor/ Project Developers(s)" shall mean the Bidder(s) selected by TSREDCO pursuant to this RFS of different states of India for Implementation of Grid Connected Roof Top Solar PV System as per the terms of the RFS Documents, and to whom Letter of Allocation has been issued;
- 1.39. "SNA" shall mean State Nodal Agency.
- 1.40. "Incentive" available from MNRE under RESCO MODE is differentiated for Telangana State is 25% of benchmark cost respectively.
- 1.41. "Tendered Capacity" shall mean the total aggregate capacity proposed to be allocated by TSREDCO to the Successful Bidder through this bidding process as per terms and conditions specified therein;
- 1.42. "TSREDCO" Telangana State Renewable Energy Development Corporation Limited
- 1.43. "Wp" shall mean Watt Peak

INTERPRETATIONS

- 1. Words comprising the singular shall include the plural & vice versa
- 2. An applicable law shall be construed as reference to such applicable law including its amendments or re-enactments from time to time.
- 3. A time of day shall save as otherwise provided in any agreement or document be construed as a reference to Indian Standard Time.

4. Different parts of this contract are to be taken as mutually explanatory and supplementary to each other and if there is any differentiation between or among the parts of this contract, they shall be interpreted in a harmonious manner so as to give effect to each part.
5. The table of contents and any headings or sub headings in the contract has been inserted for case of reference only & shall not affect the interpretation of this agreement.

SECTION – C

TENDER SCHEDULE

1. PREAMBLE:

The scope of work for the bidder include complete design, shadow analysis of roof top, engineering, manufacture, supply, storage, civil work, erection, testing & commissioning of the various capacities of 1-1000KWp grid connected rooftop solar PV projects including operation and maintenance (O&M) of the project and **cleaning of modules at regular intervals** for a period of Five years after commissioning at various locations of Govt. Buildings in Telangana State through e-procurement platform (i.e. www.tender.telangana.gov.in).

The Govt. of Telangana has announced Telangana Solar Power Policy 2015 with provisions for promotion of Grid connected Solar Rooftop systems with net metering/gross metering option to the consumers. The following are the provisions for promotion of grid connected solar rooftop TS. Solar Power Policy 2015,

- The Government will promote solar rooftop systems on public buildings, domestic, commercial and industrial establishments.
- The consumers are free to choose either net or gross meter option for sale of power to DISCOM and the applicable tariff for either of the cases shall be equal to average Cost to Service of the DISCOM which will be determined by TSERC every year.
- Permission will be given to the group of persons / society to set up solar power projects and will be treated as collective generation for supply of power to the households of each society / group member.
- Time bound clearance of proposals through online mode.

The DISCOMs have issued the implementation guidelines based on the promotion policy announced by the GoTS.

On behalf of consumers under this scheme therein, TSREDCO inviting Bids for empanelment for Supply, Installation, Commissioning, maintenance and Operation of Solar Rooftop Power plants for 25 years in Telangana State, under Net Metering Policy to take up the projects under RESCO MODE. Bidders can quote for separate rate in the categories of **1 - 10 KWp, 11-100 KWp, above 100 KWp** grid connected SPV systems. Bidders shall quote separately for each category.

A common lowest feasible price shall be discovered based on levelized tariff for 25 years in Rs./KWh for each category of plants based on their size in KWp and the list of Successful bidder(s) who agree to Supply, install and operate the systems at such lowest feasible discovered

tariffs shall be uploaded in the TSREDCO website. TSREDCO doesn't assure the Successful Bidder(s) for award of any Projects solely on the basis of being successful bidder in this Tender, and the Bidder is required to identify approach the end users or beneficiaries directly in order to encourage implementation of these Projects. The end users or beneficiaries shall have the freedom to select the supplier of their choice from the final list uploaded by TSREDCO. The User Agency or TSREDCO shall issue work order and enter into BOOT agreement directly with the bidder.

The Successful Bidder(s) shall work closely with the State Government departments, Institutions, non-profit organizations institutions in implementing the above work and ensure success of the program. Installations will have to be generally done as follows from receipt of work orders/entering into agreements with the User Agency /TSREDCO.

Sl. No	Capacity	Duration
1	1 – 10KWp	60 Days
2	11 – 100KWp	120 Days
3	Above 100KWp	180 Days

2. INCOME TAX:

During the course of the contract period, deduction of income tax and surcharge as in force at source shall be made at the prevailing rate of income tax department issued from time to time of the gross amount of each bill.

3. RATES , TAXES AND DUTIES:

All the rates in the tender shall be inclusive of all statutory compliances like PF, ESI, Service Tax, GST, etc. However, any changes made to the tax structure by the government shall be duly considered and appropriate changes made.

4. BID DETAILS:

Bids are invited from the prospective bidders for the tendered capacity i.e. aggregated capacity of **05MWp** against each based on the Project Cost (RESCO Mode)

The bid shall be on RESCO MODE for design, supply, installation and commissioning of grid connected solar rooftop systems and the levelized tariff quoted by the bidders for 25 years considering rate shall not exceed Rs. 4.80/- per unit for Government buildings.

The bidder shall pay 20 paisa /unit to TSREDCO throughout 25years out of the bidded tariff where incentives are extended by TSREDCO towards project monitoring and coordination charges.

5. BID PRICE:

- Unit Rate (Rs/Wp) for Category shall not exceed *latest MNRE Benchmark Cost*.
- The price should be quoted in Indian Rupees in online, failing which the bid would be rejected. The price shall be written both in figures & words in the prescribed offer form.

- c. The rates quoted by the bidder shall be fixed for the duration of the contract period and shall not be subject to adjustment on any account except on account of any statutory changes made to the tax structure by the government
- d. If there is a discrepancy between amount in words and figures, the amount in the words will prevail.
- e. Incomplete and/or conditional bids shall be liable to rejection. Prices should be quoted as per the format of price bid.

6. EARNEST MONEY DEPOSIT / SECURITY DEPOSIT:

- a. The tender should accompany with Earnest Money Deposit (EMD) for **Rs.2,00,000/-** by way of crossed Demand Draft drawn from any Nationalized Bank in favour of the TSREDCO, payable at Hyderabad.
- b. Firms claiming Exemptions for Bid Security shall submit letter from NSIC/ MSME/SSI **for this work specifically.**
- c. The EMD will be returned to unsuccessful tender, whereas in the case of successful tenderers, it will be retained.
- d. The successful bidder will have to deposit a security deposit at the time of concluding agreement.
- e. **Security Deposit:** At the time of allocation of projects, the bidder shall submit Performance Guarantee of Rs.7,50,000/- for each 500 KWp system on proportionate basis for the total capacity allotted to take up the project under RESCO MODE. This Performance Guarantee amount shall be submitted in the form of DD in favour of "TSREDCO, Hyderabad" OR Bank guarantee of Rs. 15,00,000/- from any nationalized/scheduled bank. The bank guarantee should be valid for a period of one year OR Completion date of the project whichever is earlier from the date of allocation of project. No interest shall be paid by TSREDCO on the amount.
- f. The Security Deposit /Bank Guarantee of successful tenderer will be retained for the period of contract in force and will be returned after expiry of the contract period, after deducting the outstanding liabilities if any. The Security Deposit/Bank Guarantee shall not carry any interest.

7. INSTRUCTIONS TO BIDDERS:

- a. Tenders with over writings, alterations etc., will not be admitted unless they are attested by the bidder. Where there is a discrepancy between the rupees in figures and words, the price, which is least of the two, will govern.
- b. BID should be strictly in conformity with the Terms and Conditions mentioned in the tender schedule.
- c. Bidders are expected to examine all the terms and instructions mentioned in the tender schedule and prepare their proposals accordingly. Failure to provide all

requisite information will be at the bidders' own risk and may result in the rejection of the tender.

- d. All assertions made in connection with the tender are to be supported / substantiated by relevant documents. The Vice Chairman and Managing Director, TS REDCO, Hyderabad reserves the right to verify the credentials of the bidder as per the eligibility criteria.
- e. The Vice Chairman and Managing Director, TS REDCO, Hyderabad, will notify the bidder whose tender has been accepted.
- f. The successful bidder shall execute an agreement with The Vice Chairman and Managing Director, TS REDCO, Hyderabad on Non-judicial stamp paper worth Rs.200.00 agreeing to all the conditions of the contract within one week upon intimation of acceptance of Tender. Failure to enter into an agreement within the stipulated time will result in forfeiture of the EMD.
- g. The Vice Chairman and Managing Director, TS REDCO, Hyderabad, reserves the right to issue instructions / modifications at any point of time before award of contract.

8. METHOD OF SUBMISSION:

Bids shall be submitted online on www.tender.telangana.gov.in Platform. The participating bidders in the tender should register themselves on e-procurement platform in the website www.tender.telangana.gov.in

- a. Bidders can log-in to e-tender platform in secure mode only by signing with the Digital certificates.
- b. The bidders, who are desirous of participating in e- tender, shall submit their technical bids, price bids as per the standard formats available at the e-market place.
- c. The bidders shall sign on all the statements, documents certificates uploaded by them, owning responsibility for their correctness/authenticity.
- d. The bidders should scan and upload the respective documents in Technical Documentation as per the check list.
- e. After uploading the documents, the copies of the uploaded technical bid documents in hard copy and original Demand Drafts in respect of Bid Security and Bid document fee are to be submitted by the bidder to the "The Vice Chairman and Managing Director, TSREDCO, Hyderabad, Telangana", on or before **05:00PM on 11.10.2018.**
- f. Failure to furnish any of the uploaded documents, certificates, will entitle in rejection of the bid. The Vice Chairman and Managing Director, TS REDCO, Hyderabad shall not hold any risk on account of postal delay. Similarly, if any of the certificates, documents, etc., furnished by the Bidder are found to be false / fabricated / bogus, the bidder will be disqualified, blacklisted, action will be initiated as deemed fit and the Bid Security will be forfeited.
- g. The Vice Chairman and Managing Director, TSREDCO, Hyderabad will not hold

- any risk and responsibility regulating non-visibility of the scanned and uploaded documents.
- h. The Documents that are uploaded online on e-market place will only be considered for Bid Evaluation.
 - i. **In case of consortium either the prime bidder or the consortium partner can purchase the bid document. The bid can be filled either with user ID of prime bidder or consortium partner.**
 - j. The rates should be quoted online only.

9. EVALUATION PROCEDURE:

- For short listing of agency the following criteria shall be applied. For this purpose agency shall submit proof documents along with the tender and the agency not confirming to any of these parameters will not qualify for short listing.
- a. The Tenders will be opened as per the schedule by The Vice Chairman and Managing Director, TSREDCO, Hyderabad or his authorized representative in the presence of the bidders or their authorized representative who may be present at that time.
 - b. The Technical Bids consisting of the documents related to Eligibility criteria will be opened first. The tenders will be evaluated so as to ascertain the capability of the bidders to provide the services for the period mentioned above and also to assess whether the bidder satisfies the eligibility criteria.
 - c. The Financial/Price Bids of only those bidders, who have fulfilled the eligibility criteria above, will be opened online and the Price Bid of the bidders who do not fulfill the eligibility criteria will not be opened and their Tender shall stand rejected.
 - d. Any claims or disputes raised by the unsuccessful bidders in respect of selection process and non-allotment of award will have no legal validity and will not be enforceable against The Vice Chairman and Managing Director, TS REDCO, Hyderabad. No further correspondence will be entertained regarding the disqualification.
 - e. The Vice Chairman and Managing Director, TS REDCO, Hyderabad, reserves the right to accept or reject any / or all the tenders without assigning any reasons whatsoever. The Vice Chairman and Managing Director, TS REDCO, Hyderabad also reserves the right to cancel the selection process for award of the contract at any time. The decision of The Vice Chairman and Managing Director, TS REDCO, Hyderabad is final and binding.

10. SUCCESSFUL BIDDER(S) SELECTION

- a. Bids qualifying in Clause 5 shall only be evaluated in this stage.

- b.** Letter(s) of Allocation (LOA): The Letter(s) of Allocation (LOA) shall be issued to all such Successful Bidders(s) selected as per the provisions of terms and conditions
- c.** Each Successful Bidder shall acknowledge the LOA and return duplicate copy with signature & stamp of the authorized signatory of the Successful Bidder to the TSREDCO within Seven (07) days of issue of LOA.
- d.** If the Successful Bidder, to whom the Letter of Allocation has been issued, does not fulfill any of the conditions specified in Bid document, the TSREDCO reserves the right to annul/cancel the award of the Letter of Allocation of such Successful Bidder and forfeit the PBG/Bid Bond. In order to speed up the implementation.
- e.** The TSREDCO at its own discretion, has the right to reject any or all the Bids without assigning any reason whatsoever, at its sole discretion
- f.** The empaneled suppliers, who promotes the solar installations in various Govt. departments, if they get the orders to TSREDCO. Accordingly, the concerned orders will be allotted to them only.
- g.** If the Bidder fails to commission the project within specified time, penalty on per day basis calculated for the Performance Security on a 3 month's period would be levied. After 3 months, the project will get cancelled and the total PBG/SD would be forfeited.

11.1 PROJECT ALLOCATION AND SANCTION

- a)** The identification of the projects (roof tops) at the time of bidding is not mandatory. The Bidders, however, in their own interest are advised to make a preliminary survey of availability of roof tops for which they intend to Bid and as prescribed in the Tender, as well as issue of Grid connectivity, as non-availability of roof tops and non-completion of other formalities after allocation of project will result in forfeiture of Bid Bond/PBG amount submitted by them.
- b)** Successful bidders shall share the time and date stamping photographs of the roofs / open space and location details (Address) with TSREDCO before entering into any legal agreement with the Owner. This has to ensure that the location identified by the Successful bidder is freshly identified and strictly complying the norms provided in Clause 13.2 below.
- c)** For identification of projects, TSREDCO may provide help. However, the entire responsibility of finding the buildings lies with the Bidder.
- d)** Onus of identifying the buildings/rooftops and completing the other documentation like finalizing the Project report and entering into agreements with the buildings/rooftops owners lies with the Successful Bidder within the above-mentioned time frame even for the buildings/rooftops identified by TSREDCO for preferential installation.
- e)** After the Project Sanction Documents have been submitted by the Successful Bidder/ Project Developer and accepted by TSREDCO, TSREDCO will issue the Sanction Letter(s) for the Project (s) indicating the Incentive amount(s) which will be disbursed in line with the provisions of the Tender document. The Bidder shall complete the design,

engineering, manufacture, supply, storage, civil work, erection, testing & commissioning of each project within 12 months from the date of issue of letter of allocation.

- f) If the Bidder fails to commission the sanctioned project within specified time from the date of LOA, penalty/LD on per day basis calculated for the Performance Security on a 6 month's period would be levied. After 6 months, the project will get cancelled and the total PBG would be forfeited.
- g) In case, due to delay, PBG submitted by the bidder(s) is forfeited in full/part, bidder has to resubmit the PBG of requisite amount and validity as per the Tender, failing which their Incentive amount shall not be released.

11. PERFORMANCE SECURITY

- a. Within 7 days of receipt of the Letter of Acceptance, the Successful Bidder shall deliver to the Employer a Performance Security in any of the forms given below for an amount equivalent to 10% of the Contract price. Bank draft, in favour of **TS REDCO payable at Hyderabad** drawn on any scheduled Bank/Nationalized Bank.
- b. If the performance security is provided by the successful Bidder in the form of a Bank Guarantee, it shall be issued by a Nationalized Bank/Scheduled Bank and acceptable to the Employer.
- c. Failure of the successful Bidder to comply with the requirements of Sub-Clause 12 (d) shall constitute sufficient grounds for cancellation of the award and forfeiture of the Bid Security.

12. PROJECT COST

- a. The Project cost shall include all the costs related to above Scope of Work. Bidder shall quote for the entire facilities on a "single responsibility" basis such that the total Bid Price covers all the obligations mentioned in the Bidding Documents in respect of Design, Supply, Erection, Testing and Commissioning including Warranty, Operation & Maintenance and **cleaning of modules at regular intervals** for a period of 25 years (under RESCO Model). The Bidder has to take all permits, approvals and licenses, Insurance etc., provide training and such other items and services required to complete the scope of work mentioned above.
- b. The project cost quoted is on turnkey basis and the bidder/bidders are responsible for the total Scope of Work described above.
- c. The project cost shall remain firm and fixed and shall be binding on the Successful Bidder till completion of work for payment of subsidy amount irrespective of his actual cost of execution of the project. No escalation will be granted on any reason whatsoever. The bidder shall not be entitled to claim any additional charges, even though it may be necessary to extend the completion period for any reasons whatsoever.

- d. The project cost shall be inclusive of all duties and taxes, **insurance etc** .The prices quoted by the firm shall be complete in all respect and no price variation /adjustment shall be payable
- e. The operation & maintenance of Solar Photovoltaic Power Plant would include wear, tear, overhauling, machine breakdown, insurance, and replacement of defective modules, invertors / Power Conditioning Unit (PCU), spares, consumables & other parts for a period of 5 years

SECTION – D

(Bid Information to Bidders)

1. INTRODUCTION:

- ❖ **The priority will be given to L1 bidder minimum 10% capacity on the total allotted capacity.**
- ❖ **Only least bidded (quoted) and accepted to L1 price of 10bidders will be empanelled incl. L1.**
- ❖ **Higher experience will be taken into consideration for empanelment, if same price / tariff quoted by more than one bidder.**
- ❖ **The empaneled System Integrators, who promote the solar installations in various Govt. Departments, for getting orders to TSREDCO, the concerned orders will give priority in allotment.**

- 1.1 The scheme targets installation of cumulative 5MW capacity grid-connected roof top solar PV projects at various Govt. Buildings in Telangana State. The generated solar power may be utilized for captive application and the surplus power will be fed to the grid. The scheme aims to reduce the fossil fuel-based electricity load on main grid and make building self-sustainable from the point of electricity to the extent possible.
- 1.2 TSREDCO, which expression shall also include its successors and permitted assigns, hereby invites interested companies to participate in the bidding process for the selection of Successful Bidder(s) for implementation of large scale grid-connected roof top Solar Photovoltaic Projects.
- 1.3 The bidders, who are techno-commercially qualified, shall be empaneled with TSREDCO. The tenure of empanelment shall be one year from the date of empanelment letter issued by TSREDCO and bidder also shall be empaneled district wise or state

wise. TSREDCO at its sole discretion and as per the requirement may renew the tenure of empaneled agencies.

- 1.4 The Bidder is advised to read carefully all instructions and conditions appearing in this document and understand them fully. All information and documents required as per the bid document must be furnished. Failure to provide the information and / or documents as required may render the bid technically unacceptable.
- 1.5 The bidder shall be deemed to have examined the bid document, to have obtained his own information in all matters whatsoever that might affect the carrying out the works in line with the scope of work specified elsewhere in the document at the offered rates and to have satisfied himself to 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 he has to complete in accordance with the bid documents irrespective of any defects, omissions or errors that may be found in the bid documents.

2. SIZE OF THE PROJECTS:

2.1 The size of each project shall be in the range from above 1kWp to 1000 kWp. One project may however comprise of several rooftop units. Each roof top unit can separately connect with the grid and may have separate meters. The bidder shall quote separately for different capacities i.e. 1-10 KWp, 11-100 KWp and above 100 KWp.

2.2 Further, Successful bidders to whom letter of allocation has been issued will be allowed to submit single proposal for an aggregate capacity not less than 500 kWp for approval and issue of sanction letter by TSREDCO. Single sanction letter will be issued for the total aggregate capacity of 2000KWh submitted by the bidder for approval as per above.

4. ELIGIBILITY CRITERIA

4.1.

- a. Any Developer who qualifies the Financial criteria can submit the bid. However the execution of the project should be carried only by a Registered SPV Suppliers/ Manufacturers/ System Integrators empanelled with TSREDCO in the Year 2018-19.
- b. The bidder shall submit the Solvency certificates from banks etc.) of not less than Rs. 2.50 crores for each 0.50 MW capacity
- c. Successful Bidder/Bidding Consortium should establish authorized service station in Hyderabad, if not having one already. Accordingly under taking is to be given. If already having service station, proof to be submitted.
- d. Certificate to the effect that the Solar PV Modules supplied are indigenously manufactured [India]. – Proof to be submitted.

- e. Bidder/Bidding Consortium Certification/Registration with TS REDCO should be valid while tendering and for at least upto the completion of the agreement.
- f. The drawings submitted by the bidder shall conform to the actual site conditions and to ensure the same a site visit report attested by Engineer (Electrical) of TS REDCO should be annexed.

4.2 The Bidder should be either a body incorporated in India under the Companies Act, 1956 or 2013 including any amendment thereto and engaged in the business of Solar Power.

A copy of certificate of incorporation shall be furnished in the bid in support of above.

4.3 The Bidder should have designed, supplied, installed & commissioned at least one Grid connected Solar PV Power Project having a capacity of not less than the capacity indicated for eligibility under different categories as detailed below. The list of project commissioned prior to Techno-Commercial Bid Opening date, indicating whether the project is grid connected, along with a scanned copy of the Commissioning certificate and Work order / Contract / Agreement/ from the Client/Owner shall be submitted(online) in support.

Project Category	Minimum Experience	MNRE Bench Mark Cost (Rs.)
1 to 10 kWp	At least One Grid connected Solar Rooftop PV Project of 10 kWp Capacity at Single location.	Rs. 60/ Wp
11 to 100 kWp	At least One Grid connected Solar Rooftop PV Project of 50 kWp Capacity at single location or single project.	Rs. 55/Wp
Above to 100 kWp	At least One Grid connected Solar Rooftop PV Project of 300 kWp Capacity at single location or under single project.	Rs. 53/ Wp

4.4 The bidder should have annual turnover of Rupees 5.00Crore in any one of the last 3 financial years preceding the Bid Deadline subjected to the condition that the Bidder should at least have completed one financial year.

4.5 The bidder shall have a liquid assets and/or credit facilities of not less than Rs. 2.5 crores (credit facility) / Letter of Credits / Solvency Certificates from Banks etc.,) for each one Megawatt capacity.

4.6 The Bid submitted by a Consortium should comply with the following additional requirements failing which shall result in disqualification.

- Number of members in a Consortium should be limited to three (3).
- The Bid should contain the information required for each member of the Consortium
- Each Consortium must nominate a lead member/prime bidder of the Consortium and must submit the Power of Attorney by all members of the Consortium in favour of the lead member/prime bidder.

- Any Company applying as a sole Bidder cannot at the same time be member of any Consortium applying for this Project. Further, a member of a particular Consortium cannot be member of any other Consortium applying for this Project. Any Bidder who submits or participates in more than one Bid for this Project will be disqualified and will also lead to disqualification of the Consortium of which it is a member.
- Members of the Consortium shall enter into a memorandum of understanding (MoU) specific to this Project which shall be submitted with the Tender document. The MoU shall, inter alia:
 - Convey the intent to form a Consortium, with commitments in accordance with the Tender Document, which would enter into the Project Agreement and subsequently carryout all the responsibilities as Implementing Agency in terms of the Project Agreement, in case the Project is awarded to the Consortium.
 - Clearly outline the proposed roles and responsibilities of each member at each stage.

The members of the Consortium shall be jointly liable for the execution of the Project in accordance with the terms of the Project Agreement; however, TSREDCO will interact with lead member who shall own all liability and responsibility on behalf of consortium.

The Consortium as a whole must be a sound entity both technically and financially.

4.7 In case the Bidder wishes to incorporate a Project Company, in such a case Bidder if selected as a Successful Bidder can incorporate a Project Company.

Bidder shall be responsible to get all clearance required/ obtained in the name of the Bidding Company transferred in the name of the Project Company.

4.8 The aggregate equity share holding of the Successful Bidder in the issued and paid up equity share capital of the Project Company shall not be less than fifty-one percent (51%) up to a period of Five (5) years from the date of commissioning of the entire Sanctioned Capacity of the Project Developer.

4.9 The bidder shall indicate the details of the districts where they are interested to take up the projects. The preference will be given for allotment of districts to the bidders based on their choice. However, TSREDCO may or may not allot the districts opted by the bidder taking into consideration the potential in each district.

5. BID SECURITY

5.1.1 The tenderer shall furnish bid security of Rs. 2,00,000/- as mentioned in the “Particulars of Tender” in the shape of DD in favour of, TSREDCO, payable at Hyderabad. Bank guarantee can also be submitted in place of DD towards bid security amount from any Nationalized / scheduled bank in favour of “ VC & Managing Director, TSREDCO, Hyderabad”, as a part of the tender. The bank guarantee should be **valid for a period of two years beyond the validity of offer**. Tenders without bid security shall be rejected by TSREDCO as being non-responsive. No interest shall be paid by TSREDCO on the amount of bid security.

5.1.2. The bid security may be forfeited: -

- a) If a Tenderer withdraws his tender during the specified period of Tender.
- b) If the successful Tenderer fails to sign the contract agreement within stipulated period with the user agency.

5.1.3 At the time of allocation of projects, the bidder shall submit Performance Guarantee of Rs.7,50,000/- for each 500 KWp system on proportionate basis for the total capacity allotted to take up the project under RESCO MODE. This Performance Guarantee amount shall be submitted in the form of DD in favour of “TSREDCO, Hyderabad” OR Bank guarantee of Rs.15,00,000/- from any nationalized/scheduled bank. The bank guarantee should be valid for a period of one year OR Completion date of the project whichever is earlier from the date of allocation of project. No interest shall be paid by TSREDCO on the amount of security money deposit.

5.1.4 The authority reserves the right of awarding the work.

5.1.5 The bid security of all unsuccessful bidders shall be released soon after selection of selected bidder(s).

5.1.6 The Performance Guarantee amount will be returned after successful commissioning of the project.

5.2 PERIOD OF VALIDITY OF TENDER

5.2.1. Validity of the offer should be 3 months from the proposed date of opening of the Technical bid. Tenders without this validity will be rejected. However, once empaneled the finalized tariffs shall be applicable for a period of one year within which period the project will be allotted. The levelized tariff shall be applicable for entire **RESCO period i.e. 25 years without any escalation.**

5.2.2 In exceptional circumstances, TSREDCO may solicit the consent of the Tenderers to an extension of the period of validity of offer. The request and the response there of shall be made in writing

5.2.3 INTENT OF SPECIFICATION

Intent of the specification is to describe the requirement of the employer for procurement and installation of equipments, civil works and other auxiliary and support facilities and to provide inputs to Bidder/Bidding Consortium to enable them to prepare and submit their techno-commercial proposal to meet this requirement. The specification intends to cover the design, engineering, manufacture, supply, transportation, un-loading, storage, in-plant transportation to site from stores, erection, testing & commissioning and performance guarantee and enabling work as encountered during execution of work

Relevant details necessary for preparation and submission of best offers are included in the subsequent sections of these specifications. However the Bidder/Bidding Consortium are free to suggest any superior technology/ practices where ever required, with full details, as an alternative

The specification shall be read in totality and the bid shall be prepared accordingly.

5.3 FORMATS AND SIGNING OF TENDER

5.3.1 The tender must contain the name and places of business of the firm/person/persons participating in the tender and must be signed and sealed by the Tenderer with his usual signature. The name and designation of all persons signing the tender document should be written below every signature. Tender by a partnership firm must be furnished with full name of all partners with a copy of partnership deed.

5.3.2 The original copy of the tender should be typed or written in indelible ink and must be signed with the legal name of the corporation/ company by the President/ Managing Director/ Secretary of the firm or a person duly authorized to bid. In case of authorized person the letter of authorization by written power-of-attorney should be enclosed with the technical bid of the tender. The person or persons signing the tender shall initial all pages of the tender document.

5.3.3 The tender shall contain no interlink actions, erasers or overwriting except as necessary to correct the errors made by the tenderer in the preparation of tender. The person or persons signing the tender shall also sign at all such corrections.

5.4 PRICE AND CURRENCIES

The tenderer shall have to submit their rates in Indian Rupees only including all latest applicable taxes & duties of Govt. of Telangana as well as Govt. of India. Moreover, TSREDCO will not be responsible for providing Road permits. It is to be obtained by the selected bidder only and necessary Entry Tax (as admissible) will have to be borne by the selected bidder if any. The rate should be quoted on the prescribed format for Financial Bid (Part II) attached to this tender document.

6. SCOPE OF WORKS AND SERVICES

Scope of Supply & Work includes Design, Engineering, Manufacture, Procurement & Supply of equipment and materials; testing at manufacturers works, inspection, packing and forwarding, unloading at site, associated civil works, services, permits, installation and incidentals, erection, testing and commissioning of 1-1000kWp various capacities of Grid tied Solar PV Power Plants with associated equipments and materials under Net-metering Scheme & RESCO Mode, on turnkey basis at Various Govt. Buildings in Telangana State. The equipment and materials for 1-1000kWp Grid tied Solar PV Power Plants with associated system shall include but not be limited to the Design, Supply, Erection, and Testing & Commissioning of the following equipments and sub-systems:

- a. Solar PV modules including mounting frames, Mounting structures, foundation bolts and nuts for holding structures and module inter connection, Array Junction boxes / String combiner Box with surge protection and monitoring system.
- b. Power Control Unit/s including MPPT (Maximum Power Point Tracking) charge controller and synchronizing facility at 415V,50Hz
- c. AC Distribution Board/s
- d. Auxiliary AC & DC power system for control and protection system for the total plant complex including Battery and Battery charger for inverter and other such accessories that require a power backup.
- e. Plant Monitoring Desk (Remote Monitoring System) from **ranging of 1KWp**
- f. Monitoring system for all electrical parameters of the solar PV plant

- g. Solar Observatory/Weather Monitoring system to check Solar Irradiation, Wind Speed & Ambient Temperature
- h. Protection and Metering system for the complete installation including Meters, Relays and other associated devices
- i. Earthing and Lightning Protection system for the complete installation
- j. AC/DC Power and Control Cables and accessories
- k. Communication system with existing plant installations and control rooms
- l. Nomenclature, Danger Plates, Name Plate, Instructions etc.
- m. Civil works including, foundations, structures for safety of the plant and inverters as may be required.
- n. Contractor should obtain necessary permissions and approvals from the TSTRANSCO/TSDISCOMs and Electrical Inspectorate/CEIG for implementation of the projects and net-metering and submit a copy of the same to Concern beneficiary Department and TSREDCO officials.
- o. The contractor has to prepare total project (design) documents related to this work as per MNRE formats and obtain incentives on behalf of beneficiary Department officials will sign on application forms, if any.
- p. The project / plant capacity will be considered of the installed solar Module capacity or installed solar inverter capacity, whichever is lower.
- q. The empanelled system integrator has to be collected following documents from the beneficiary.

A copy of Application forms in TSREDCO & MNRE formats, Technical Feasibility from concerned DISCOMs, Concerned beneficiary P.P Size photo, aadhar card, mobile no & Electricity bill, Beneficiary certificate/ ID card, Invoice, Commissioning reports (Part- A, B &C), Work completion & Inspection Photos along with beneficiary, Modules, Inverter Serial Nos & Test Reports, Audited Statement of Expenditure, Joint Inspection Report in MNRE format, Net Metering Work Completion & Synchronization reports, RMS details, and bill of material has to be submitted to TSREDCO for release of Incentives of MNRE/State.

6.1 Scope of Beneficiary:

1. Cleaning and clearing the roof top of any unwanted things and making it suitable for erection of the solar roof top power plant.
2. Drinking water service in the power plant complex and suitable water supply for periodic cleaning of solar PV modules.

6.2 LEVELLIZED TARIFF:

- The levelized Tariff of 25 years shall include all the costs related to above Scope of Work. Bidder shall quote for the entire facilities on a “single responsibility” basis such that the total Bid Price covers all the obligations mentioned in the Bidding Documents in respect of Design, Supply, Erection, Testing and Commissioning including Warranty, Operation & Maintenance (for a period of 25 years for RESCO), goods and services including spares required if any during O&M period. The Bidder has to take all permits like CEIG and other approvals and licenses, Insurance etc., provide training and such other items and services required to complete the scope of work mentioned above.
- The Levelized tariff is on lump sum turnkey basis and the bidder is responsible for the total Scope of work described above.

- The levelized tariff shall remain firm and fixed and shall be binding on the Successful Bidder till completion of work for payment of Incentive amount irrespective of his actual cost of execution of the project. No escalation will be granted on any reason whatsoever. The bidder shall not be entitled to claim any additional charges, even though it may be necessary to extend the completion period for any reasons whatsoever.
- The levelized tariff shall be inclusive of all duties and taxes, insurance etc. The prices quoted by the firm shall be complete in all respect and no price variation /adjustment shall be payable by TSREDCO. However, statutory variation of taxes and duties may be paid by the roof top owner.
- The Operation & Maintenance of Solar Photovoltaic Power Plant would include wear, tear, overhauling, machine breakdown, insurance, and replacement of defective modules, invertors / Power Conditioning Unit (PCU), spares, consumables & other parts for a period of 25 years.
- The Levelled tariff shall be notified for each category of project. The levelized tariff shall be in accordance with all terms, conditions, specifications and other conditions of the Contract as accepted by the TSREDCO and incorporated in the agreement.
- The Bidder shall complete the Price Bid for different categories i.e. 01-10 KWp, 11-100 KWp and above 100 KWp.

6.3 TSREDCO SERVICE CHARGES:

- The successful bidder shall share the revenue on sale of solar power from the roof owner / identified Government Department, equivalent to 20 paisa per unit to TSREDCO towards supervision and coordination charges. The charges are exclusive of Service Tax and any other taxes, levies, duties, etc. levied by the Government from time to time, which shall be paid extra as per applicable norms.
- TSREDCO service charges are charged towards site visits, inspection, liaison, monitoring etc. Taxes and duties shall be paid extra. **The TSREDCO service charges are non-refundable and for each project the service charges have to be paid on monthly basis** based on the metered power units.

6.4 Scope of the successful Bidder/Bidding Consortium shall also include :

- a. Site Survey, Measurement of solar isolation and other relevant parameters required for design of the system.
- b. Complete Design, engineering, preparation and submission of drawings Equipment and material specification preparation.
- c. Procurement and expediting of all supplies and Delivery of equipment and material to job site.
- d. Pre-commissioning & Commissioning of all supplied Equipments and Test running of Grid Connect Solar Power Plant.
- e. Any other items not specifically mentioned in the specification but which are required for erection, testing and commissioning and satisfactory operation of the solar power plant are deemed to be included in the scope of the specification unless specifically excluded on turnkey basis.

- f. Provision of Safety items like hand gloves, shock treatment charts, rubber mats, danger/caution boards.
- g. Supply of all commissioning spares and Supply of special tools and tackles Project management including project administration, project coordination, scheduling, progress reporting to employer and adhering to safety practices during erection, commissioning and subsequent operation and maintenance of the system including fire prevention.

**7. OPERATION & MAINTENANCE (O&M) GUIDELINES
TO BE MANDATORILY FOLLOWED BY BIDDERS**

- a. The bidder shall be responsible for all the required activities for successful operation and maintenance of the Rooftop Solar PV system for a period of 25 years from the date of commissioning of the plant.
- b. O&M of Solar Power Plant shall be compliant with grid requirements to achieve committed energy generation.
- c. Deputation of qualified and experienced engineer/ technicians till the O&M period at project site.
- d. Periodic cleaning of solar modules.
- e. Supply of all spares, consumables and fixtures as required. Such stock shall be maintained for all associated equipment and materials as per manufacturer/ supplier's recommendations
- f. Immediate replacement of defective Modules, Invertors/PCUs and other equipment as and when required.
- g. Periodic checks of the Modules, PCUs and BoS shall be carried out as a part of routine preventive and breakdown maintenance.
- h. The entire equipment testing instrument required for Testing, Commissioning and O&M for the healthy operation of the Plant shall be maintained by the Bidder. The testing equipments must be calibrated once every 2 years from NABL accredited labs and the certificate of calibration must be kept for reference as required.
- i. If negligence/ mal-operation on part of the Bidder's operator results in failure of equipment, such equipment should be repaired/ replaced by the Bidder free of cost.
- j. Co-ordination with Owner / DISCOM / CEIG as per the requirement for Joint Metering Report (JMR). The person in charge present at site from bidder's side shall take a joint meter reading in the presence of rooftop owner on a **daily basis**. Furnishing generation data (JMR) each month to TSREDCO positively by 1st week of every month for the previous month.
- k. Online Performance Monitoring, controlling, troubleshooting, maintaining of logs & records. A maintenance record register is to be maintained by the operator with effect from Commissioning to record the daily generation, regular maintenance work carried out as well as any preventive and break down maintenance along with the date of maintenance, reasons for the breakdown, duration of the breakdown, steps taken to attend the breakdown, etc.
- l. For any issues related to operation & maintenance, a toll-free number shall be made available to the rooftop owner/ plant owner to resolve within 72 hours. If not attended within such stipulated time, a complaint may be raised to TSREDCO, pursuant to which, a penalty of Rs. 10,000 for full month or more shall be imposed for a system capacity up to 100 kWp and Rs.10,000 for each subsequent 100 KWp capacity.
- m. If any jobs covered in O&M Scope as per this tender document are not carried out by the contractor/ Bidders during the O&M period, the Engineer-In-Charge shall take appropriate action as deemed fit. TSREDCO reserves the right to make surprise checks/ inspection visits at its own or through authorized representative to verify the

O&M activities being carried out by the Bidder. Failure to adhere to above guidelines will result in penal action including debarring from participation in next tender.

7.1 METERING AND GRID CONNECTIVITY:

Metering and grid connectivity of the roof top solar PV system under this scheme would be the responsibility of the Bidder in accordance with the prevailing guidelines of the concerned DISCOM and / or CEA (if available by the time of implementation). TSREDCO/ SNA could facilitate connectivity; however, the entire responsibility lies with bidder only.

7.2 PLANT PERFORMANCE EVALUATION:

The successful bidder shall be required to meet minimum guaranteed generation with Performance Ratio (PR) at the time of commissioning and related Capacity Utilization Factor (CUF) as per the GHI levels of the location during the O&M period. PR should be shown minimum of 75% at the time of inspection for initial commissioning acceptance to qualify for release of eligible Subsidy/Incentive. Minimum CUF of 15% should be maintained for a period of 5 years for fulfilling one of the conditions for release of PBG. The bidder should send the periodic plant output details to TSREDCO for ensuring the CUF. The PR will be measured at Inverter output level during peak radiation conditions.

8. INSURANCE

- a. The Bidder shall be responsible and take an Insurance Policy for transit-cum-storage-cum-erection for all the materials to cover all risks and liabilities for supply of materials on site basis, storage of materials at site, erection, testing and commissioning. The bidder shall also take appropriate insurance during O&M period.
- b. The Bidder shall also take insurance for Third Party Liability covering loss of human life, engineers and workmen and also covering the risks of damage to the third party/material/equipment/properties during execution of the Contract. Before commencement of the work, the Bidder will ensure that all its employees and representatives are covered by suitable insurance against any damage, loss, injury or death arising out of the execution of the work or in carrying out the Contract. Liquidation, Death, Bankruptcy etc., shall be the responsibility of bidder.

9. WARRANTEES AND GUARANTEES

The Bidder shall warrant that the goods supplied under this contract are new, unused, and as per **MNRE specifications** of the most recent or latest technology and incorporate all recent improvements in design and materials. The bidder shall provide system warrantee covering the rectification of any and all defects in the design of equipment, materials and workmanship including spare parts for a period of 5 years from the date of commissioning. The successful bidder has to transfer all the Guarantees /Warrantees of the different components to the Owner of the project. The responsibility of operation of Warrantee and Guarantee clauses and Claims/ Settlement of issues arising out of said clauses shall be joint responsibility of the Successful bidder and the owner of the project and

TSREDCO will not be responsible in any way for any claims whatsoever on account of the above.

10. TYPE AND QUALITY OF MATERIALS AND WORKMANSHIP

- a. The Design, engineering, manufacture, supply, installation, testing and performance of the equipment shall be in accordance with latest appropriate IEC/Indian Standards as detailed in the Section- C (Technical specifications) of the bid document. Where appropriate Indian Standards and Codes are not available, other suitable standards and codes as approved by the MNRE shall be used.
- b. The specifications of the components should meet the technical specifications mentioned in Section C.
- c. Any supplies which have not been specifically mentioned in this Contract but which are necessary for the design, engineering, manufacture, supply & performance or completeness of the project shall be provided by the Bidder without any extra cost and within the time schedule for efficient and smooth operation and maintenance of the SPV plant.

11. PROGRESS REPORT

The bidder shall submit the progress report monthly to TSREDCO in Prescribed Performa. TSREDCO will have the right to depute its representatives to ascertain the progress of contract at the premises of works of the bidder.

12. Submission of Project Completion Report (PCR)

The bidder shall submit the Project Completion Report in (soft copy and signed copy) after commissioning of the project as per the Scope of Tender to TSREDCO as per the prescribed formats. Non submission of the report shall be considered as “Breach of Contract” and shall attract punitive actions as per the relevant provisions of the Contract including non-release of Subsidy/Incentive. However, the decision of Engineer-in - charge shall be final in this regard.

13.0 Submission of O&M Report (OMR)

The bidder shall submit the Monthly O&M Report mandatorily to TSREDCO as per the prescribed formats. Non submission of the report shall be considered as “Breach of Contract” and shall attract punitive actions as per the relevant provisions of the Contract including non-release of Subsidy/Incentive. However, the decision of Engineer-in - charge shall be final in this regard.

14.0 PROJECT INSPECTION

All Projects progress will be monitored by Project Director / TSREDCO and the projects will be inspected for quality at any time during commissioning or after the completion of the project either by officer(s) from TSREDCO or any agency/ experts designated / authorized by TSREDCO from time to time. TSREDCO shall depute a technical person(s) from its list of empaneled experts/ agencies from time to time for inspection,

Third party verification, monitoring of system installed to oversee, the implementation as per required standards and also to visit the manufacturer's facilities to check the quality of products as well as to visit the system integrators to assess their technical capabilities as and when required. The cost of Inspection shall be borne by Vendor only. The projects shall be inspected at any time during commissioning or after the completion of the project(s)

14.1. INSPECTION

Manufacturing progress review, inspection & testing of equipment covered under the technical specification shall be carried out by the Employer at the manufacturers' works/premises prior to dispatch, to ensure that their quality & workmanship are in conformity with the contract specifications and approved drawings.

The Bidder/Bidding Consortium shall furnish the quality assurance plan for equipment separately with suggestive stages and hold points for undertaking inspection and testing by the Employer. Total list of plant & equipment of the order shall be submitted to the Employer prior to submission of QAP.

The Employer reserves the right to visit at any stage of manufacture of plant and equipment and ask for additional inspection & tests beyond approved QAP, if it is found necessary after completion of detailed design & engineering and approval of drawings

14.2 TESTS AND INSPECTION

Following tests shall be conducted on equipment after erection and before energizing from point of view of completeness in the presence of employer:

- Visual inspection of total system
- Checking of continuity of power and control cables.
- Checking of insulation resistance for inter-connected links or cables.
- Calibration of meters by secondary injection or by primary injection
- Checking of protective schemes
- Setting of relays, and the checking of their operation with one lower and one higher setting.
- Checking of control scheme of breakers, etc. as per approved drawings and as per actual requirement
- Checking of alarm scheme by simulation of faults.
- Checking of name plate data of complete system.
- Verification of earthing resistance.
- Checking of cable terminations and laying, dressing etc.
- Checking for safe accessibility of components.

15.0 SYSTEM CONFIGURATIONS

The MNRE will be provided achievement linked incentives for implementing of Solar Grid Connected and Small Solar Power Plants from 1kWp TO 1000 kWp capacities an aggregated 05MW capacity.

15.1. The implementing agency (Central Ministry Department, State Government Department, PSU or Other Govt. organization/SNA/ULB) willing to participate in the scheme will submit their proposal online along with the list of selected buildings.

15.2. TSREDCO has proposed initially 5MW aggregate capacity for installation of solar rooftop systems under BOOT basis (RESCO MODE) in all over Telangana State. Further, there is huge potential to take up installations in private/commercial buildings under RESCO MODE. MNRE vide notification no. 5/34/2013-14/RT dated 19/11/2015 and 04.03.2016 has broadly categorized the beneficiaries as follows.

Sl. No	Achievement vis – a - vis Target Allocation	**Incentives for General Category States / UTs
1	80% and above within the sanctioned period	Rs.15000/- per kW
2	Below 80% and above 50% (including 50 %) within the sanctioned period	Rs.9000/- per kW
3	Below 50% and above 40% (including 40 %) within the sanctioned period	Rs.6000/- per kW
4	Below 40% within the sanctioned period	Nil

***In RESCO mode:** In this case, the developers are selected through a tariff-based reverse bidding. The incentive amount will be up to 25% of the bench mark cost as mentioned in the table above for general category States/UTs, The benefit of the incentives should be passed on to the customer in the form of reduced tariff by factoring incentive.

*** The project / plant capacity will be considered of the installed solar Module capacity or installed solar inverter capacity, whichever is lower.**

- **CANCELLATION OF INCENTIVE:**

TSREDCO will not release the Incentive for any shortcomings in commissioning as per technical specifications mentioned or for performance ratio (PR) below the specified limit (75%) after commissioning. Also PBG shall be forfeited in case Average CUF falls below 15% during entire O&M period of 5 years.

- **INCENTIVE DISBURSEMENT:**

TSREDCO will provide Incentives @ 25% of the bench mark cost of MNRE, where ever the MNRE incentives is applicable or as per the guidelines of MNRE amended from time to time.

The Incentive shall be disbursed as follows.

Incentive as calculated above will be released as follows:

- 100% Incentive / incentives shall be disbursed after Successful Commissioning, obtaining the NOC & grid synchronization certificate from TSDISCOMs, and completion of joint inspection after receiving of project completion reports as per point 6(q) in section D.
- The incentive amount will be disbursed as per achievement of allotted target and on submission of PCRs to MNRE and getting the incentive funds from MNRE.

TSREDCO may consider releasing Incentive on case to case basis depending on the actions taken by the Successful Bidder and subject to meeting the following conditions:

- The rooftop SPV power plant should be completed as per the Scope of Tender.
- The rooftop SPV power plant must get CEIG inspection certificate.

- c) Intimation to the concerned DISCOM: All the bidders shall intimate the concerned Discoms regarding implementation of grid connected roof top solar PV projects as per the prescribed format and submit the copy of same to TSREDCO for the purpose of release of Incentive / Incentives.
- d) The sanction and release of Incentive / Incentives are subject to sanction of same by MNRE and availability of funds.

16. APPLICABLE LAW

The Contract shall be interpreted in accordance with the laws of the Union of India. In case of disputes, the decision of TSREDCO is final and binding.

17. LANGUAGE

All documents, drawings, instructions, design data, calculations, operation, maintenance and safety manuals, reports, labels and any other data shall be in English Language. The contract agreement and all correspondence between the TSREDCO and the bidder shall be in English language.

18. OTHER CONDITIONS

1. Bidder or owner of the building has to obtain all the necessary approvals/Consents/Clearances required for Erection, Testing, Commissioning and O&M of the project including Grid connectivity. TSREDCO shall not have any responsibility in this regard.
2. The Successful bidder shall not transfer, assign or sublet the work under this contract or any substantial part thereof to any other party without the prior consent of TSREDCO in writing.
3. The Successful bidder or its subcontractors shall not display the photographs of the work and not take advantage through publicity of the work without written permission of TSREDCO and owner of the Rooftop.
4. The Successful bidder or its subcontractors shall not make any other use of any of the documents or information of this contract, except for the purposes of performing the contract.
5. TSREDCO will not be bound by any Power of Attorney granted/ issued by the Successful bidder or its subcontractors or by any change in the composition of the firm made during or subsequent to the execution of the contract. However, recognition to such Power of Attorney and change (if any) may be given by TSREDCO after obtaining proper legal advice, the cost of which will be chargeable to the Successful bidder concerned.

19. SUCCESSORS AND ASSIGNEES:

In case the TSREDCO or Successful bidder may undergo any merger or amalgamation or a scheme of arrangement or similar re-organization & this contract is assigned to any entity (ies) partly or wholly, the contract shall be binding mutatis mutandis upon the successor entities & shall continue to remain valid with respect to obligation of the successor entities.

20. SEVERABILITY:

It is stated that each paragraph, clause, sub-clause, schedule or annexure of this contract shall be deemed severable & in the event of the unenforceability of any paragraph, clause sub-clause, schedule or the remaining part of the paragraph, clause, sub-clause, schedule annexure & rest of the contract shall continue to be in full force & effect.

21. COUNTERPARTS:

This contract may be executed in one or more counterparts, each of which shall be deemed an original & all of which collectively shall be deemed one of the same instrument.

21. RIGHTS & REMEDIES UNDER THE CONTRACT ONLY FOR THE PARTIES:

This contract is not intended & shall not be construed to confer on any person other than the TSREDCO & Successful bidder hereto, any rights and / or remedies herein.

22. TAX EXEMPTIONS:

Price bids are invited inclusive of Taxes and duties. However, Tax exemptions including certificates of any sort, if available may be dealt with the concerned Department of Govt of India by the bidder. TSREDCO in no case will be responsible for providing any tax exemptions to the bidder.

23. REQUIREMENT OF APPROVALS ON MAKES OF THE COMPONENTS:

The modules should be manufactured in India only. Rest of the components can be procured from any source. However these items should meet the Technical specification and standards mentioned in Tender. The necessary approvals for makes of the PV Modules and Inverters have to be taken from TSREDCO before procurement of materials.

24. LIQUIDATED DAMAGES (LD) FOR DELAY IN PROJECT IMPLEMENTATION

TSREDCO will issue the sanction letter(s) for the Project (s) indicating the Incentive amount(s) which will be disbursed in line with the provisions of the Tender document. The Bidder shall complete identification of the roof(s), "submission of project sanction documents as per the requirement of TSREDCO", Design, Engineering, Manufacture, Supply, storage, civil work, erection, testing & commissioning of each project within times lines specified in the tender from the date of issue of Allocation letter.

If the bidder fails to commission the sanctioned project within specified time, Liquidated Damages on per day basis calculated for the Performance Security on a 6 months period would be levied. After 6 months the project will get cancelled and the total PBG amount would be forfeited.

Ex: If a project of 1MWp is delayed by 36 days then the Liquidated Damages will be levied as given below.

Liquidated Damages = ((Performance Security)/180 days)*delayed days = (20, 00,000 /180)*36 = Rs.4, 00, 000.

25. TIME OF COMPLETION OF SANCTIONED CAPACITY

The Bidder shall complete the roofs identification, submission of project sanction documents as per the requirement of TSREDCO, Engineer-in-Charge design, engineering, manufacture, supply, storage, civil work, erection, testing & commissioning of sanctioned project(s) within **times lines indicated in the Tender for different capacities** from the date of issue of allocation letter(s). In case of delay beyond scheduled commissioning period, the bidder shall be liable for Liquidated Damages as state above.

The period of construction given in Time Schedule includes the time required for mobilization as well as testing, rectifications if any, retesting and completion in all respects to the entire satisfaction of the Engineer-in-Charge.

26. COMMISSIONING /COMPLETION CERTIFICATE:

When the Successful bidder fulfils his obligation under the Contract, he shall be eligible to apply for Completion/Commissioning Certificate. The Engineer-in-Charge shall normally issue to the Successful bidder the Completion Certificate within one month after receiving any application therefore from the Successful bidder after verifying from the completion documents and satisfying himself that the Work has been completed in accordance with and as set out in Contract documents. The Successful bidder, after obtaining the Completion Certificate, is eligible to avail the Incentive as per the tender conditions.

27. DOCUMENT SUBMISSION FOR ISSUE OF COMMISSINONING/ COMPLETION CERTIFICATE

The following documents will be deemed to form the completion documents:

- a. Checklist for inspection of Roof top SPV power plants as per TSREDCO format.
- b. DISCOM consent letter
- c. DISCOM synchronisation letter
- d. CEIG approval
- e. Project completion/satisfaction certificate from roof top owner's/project developers.

28. DEDUCTIONS FROM THE CONTRACT PRICE:

All costs, damages or expenses which TSREDCO may have paid or incurred, which under the provisions of the Contract, the Successful bidder is liable/will be liable, will be claimed by the TSREDCO. All such claims shall be billed by the TSREDCO to the Contractor within 15 (fifteen) days of the receipt of the payment request and if not paid by the Successful bidder within the said period, the TSREDCO may, then, deduct the amount from any moneys due i.e., Performance Security or becoming due to the contractor or Successful bidder under the contract or may be recovered by actions of law or otherwise, if the Successful bidder fails to satisfy the TSREDCO of such claims.

29. CORRUPT OR FRAUDULENT PRACTICES

The TSREDCO requires that Successful Bidders/ Contractors should follow the highest standard of ethics during the execution of contract. In pursuance of this policy, the TSREDCO defines, for the purposes of this provision, the terms set forth as follows : "corrupt practice" means the offering, giving, receiving or

soliciting of anything of value to influence the action of a public official in the bid process or in contract execution; and “fraudulent practice” means a misrepresentation of facts in order to influence a bid process or the execution of a contract to the detriment of the TSREDCO/Govt scheme, and includes collusive practice among Bidders (prior to or after Bid submission) designed to establish Bid prices at artificial non-competitive levels and to deprive the TSREDCO of the benefits of free and open competition; will declare a firm ineligible/debarred, either indefinitely or for a specific period of time, a GOVT contract if at any time it is found that the firm has engaged in corrupt or fraudulent practices in competing for, or in executing, a Government/ TSREDCO schemes.

30. DEBARRED FROM PARTICIPATING IN TSREDCO’S ROOF TOP TENDER

TSREDCO reserves the right to carry out the performance review of each Bidder from the time of submission of Bid onwards. In case it is observed that a bidder has not fulfilled its obligations in meeting the various timelines envisaged, in addition to the other provisions of the RFS, such Bidders may be debarred from participating in TSREDCO’s any future tender for a period as decided by the competent authority of TSREDCO.

The Successful bidder must ensure that the ROOF TOP SOLAR PV SCHEME Incentive is available for newly commissioned projects i.e. for the projects whose construction/despatch of equipment’s have been started only after the issue of sanction letter/allocation letter .Any roofs on which projects has been installed or commissioned before the issue of allocation letter/sanction letter shall be construed as fraudulent activity in which case Successful bidder(s) may be debarred from participating in TSREDCO’s future tender for a period as decided by the Competent authority. However, such locations may be used for installation of additional capacity with the prior approval of competent authority.

SECTION – E (Technical specifications)

The proposed projects shall be commissioned as per the technical specifications given below. Any shortcomings will lead to cancelation of Subsidy/Incentive in full or part as decided by TSREDCO and the RESCO agreement will be terminated. Competent Authority’s decision will be final and binding on the bidder.

DEFINITION

A Grid Tied Solar Rooftop Photo Voltaic (SPV) power plant consists of SPV array, Module Mounting Structure, Power Conditioning Unit (PCU) consisting of Maximum Power Point Tracker (MPPT), Inverter, and Controls & Protections, interconnect cables, Junction boxes, Distribution boxes and switches. PV Array is mounted on a suitable structure. Grid tied SPV system is without battery and should be designed with necessary features to supplement the grid power during day time. Components and parts used in the SPV power plants including the PV modules, metallic structures, cables, junction box, switches, PCUs 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/components.

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

1. SOLAR PV MODULES

SPV CRYSTALLINE MODULES

1.1. Only indigenously manufactured PV modules with RFID and the manufacturer should provide the following minimum information laminated inside the module:

- Made in India (to be subscribed in words)
- Company name / logo
- Module number (it should indicate the voltage and rated wattage of the module)
- Serial number
- Year of make

1.2 The PV modules used must qualify to the latest edition of IEC PV module qualification test or equivalent BIS standards Crystalline Silicon Solar Cell Modules IEC 61215/IS14286. In addition, the modules must conform to IEC 61730 Part-2-requirements for construction & Part 2 – requirements for testing, for safety qualification or equivalent IS.

- a) For the PV modules to be used in a highly corrosive atmosphere throughout their lifetime, they must qualify to IEC 61701/IS 61701
- b) The total solar PV array capacity should not be less than allocated capacity (kWp) and should comprise of solar crystalline modules of minimum 250Wp and above wattage. Module capacity less than minimum 250 watts should not be accepted.
- c) Protective devices against surges at the PV module shall be provided. Low voltage drop bypass diodes shall be provided.
- d) PV modules must be tested and approved by one of the IEC authorized test centers.
- e) The module frame shall be made of corrosion resistant materials, preferably having anodized aluminium.
- f) The bidder shall carefully design & accommodate requisite numbers of the modules to achieve the rated power in his bid. TSREDCO/owners shall allow only minor changes at the time of execution.

g) Other general requirement for the PV modules and subsystems shall be the Following:

- i. The rated output power of any supplied module shall have tolerance of +/- 3%.
- ii. The peak-power point voltage and the peak-power point current of any supplied module and/or any module string (series connected modules) shall not vary by more than 2 (two) per cent from the respective arithmetic means for all modules and/or for all module strings, as the case may be.
- iii. The module shall be provided with a junction box with either provision of external screw terminal connection or sealed type and with arrangement for provision of by-pass diode. The box shall have hinged, weather proof lid with captive screws and cable gland entry points or may be of sealed type and IP-65 rated.
- iv. IV curves at STC should be provided by bidder.

1.3. Modules deployed RF identification tag. The following information to be mentioned in the RFID used on each modules (This has to be inside the laminate, but must be able to withstand harsh environmental conditions).

- a. Name of the manufacturer of the PV module
- b. Name of the manufacturer of Solar Cells.
- c. Month & year of the manufacture (separate for solar cells and modules)
- d. Country of origin (separately for solar cells and module)
- e. I-V curve for the module Wattage, I_m , V_m and FF for the module
- f. Unique Serial No and Model No of the module
- g. Date and year of obtaining IEC PV module qualification certificate.
- h. Name of the test lab issuing IEC certificate.
- i. Other relevant information on traceability of solar cells and module as per ISO 9001 and ISO 14001

WARRANTIES:

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 specified below for a period not less than five (05) years from the date of sale to the original customer ("Customer")
- ii. Defects and/or failures due to manufacturing
- 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.

2. MODULE MOUNTING STRUCTURE

- a. The module alignment and tilt angle shall be calculated to provide the maximum annual energy output. This shall be decided based on the location of array installation.
- b. The structure shall be designed to allow easy replacement of any module and shall be in line with site requirement.
- c. The structures shall be fixed to the foundation in such a manner that, in future is required they can be easily relocated to a different foundation.
- d. The mounting structure shall be designed for simple mechanical and electrical installation. It shall support SPV modules at a given orientation, absorb and transfer the mechanical loads to the base properly.
- e. The mounting steel structure shall be as per latest BIS 2062 (amended up to date) and galvanization of mounting structure shall be in compliance of BIS 4759 (amended up to date).
- f. The array structure shall be so designed that it will occupy minimum space without sacrificing the output from SPV panels at the same time.
- g. Nut & bolts, supporting structures including Module Mounting Structures shall have to be adequately protected from atmosphere and weather prevailing in the area.
- h. All fasteners shall be of stainless steel of grade SS 304.
- i. The Mounting structure shall be grounded properly using GI strips and maintenance free earthing kit.
- j. The Mounting structure shall be so designed to withstand the speed for the wind zone of the location where a PV system is proposed to be installed (wind speed of 150 km/hour). **It may be ensured that the design has been certified by a recognized Lab/ Institution in this regard and submit wind loading calculation sheet to TSREDCO.** Suitable fastening arrangement such as grouting and calming should be provided to secure the installation against the specific wind speed.
- k. IS 800-2007 shall be followed for structural design.
- l. SPV module mounting structure shall be fixed type with provision of manual correction in tilt angle which shall be made after every 3 months to get maximum output. Azimuth shall be 0 degree True south
- m. Hot dipped Galvanized Steel Structural with minimum 80 microns of galvanization must be considered for all type of structural steel proposed for the power plant
- n. Design drawings with material selected shall be submitted for prior approval of the employer.
- o. The Bidder/Bidding Consortium/Bidding Consortium shall specify installation details of the PV modules and the support structures with appropriate diagram and drawings.

3. STRING COMBINER BOX OR ARRAY JUNCTION BOXES

- a. The junction Boxes shall have suitable arrangement for the followings :-
 - Combine groups of modules into independent charging sub-arrays that will be wired into the controller.
 - Provide arrangement for disconnection for each of the groups.
 - Provide a test point for each sub-group for quick fault location
 - To provide group array isolation
- b. The string combiner box/ junction box shall be dust proof, vermin proof, and waterproof and made of Polycarbonate Plastic
- c. The terminal will be connected to copper bus-bar arrangement of proper size to be provided. The junction boxes shall have suitable cable entry points fitted with cable glands of appropriate sizes for both incoming and outgoing cables
- d. Suitable markings shall be provided on the bus-bars for easy identification and cable ferrules will be fitted at the cable termination points for identification.
- e. The string combiner box/ junction box shall be with protection class IP 65 for mounting outside in Open weather condition.
- f. Each string combiner box/ junction box will have suitable Reverse Blocking Diodes of maximum DC blocking voltage of 600V / 1000V, whichever causes less power loss, with suitable arrangement for its connecting
- g. The string combiner box/ Array junction Box will also have suitable surge protection device.
- h. The current carrying ratings of the string combiner box/ junction box shall be suitable with adequate safety factor, to inter connect the Solar PV system corresponding to the project capacity, as designed by the Bidder/Bidding Consortium
- i. Necessary sensors and transducers shall be provided in the string combiner boxes to facilitate monitoring of all string parameters in the data acquisition system.
- j. String level remote monitoring facility shall be incorporated to monitor generation and faults at string level.

4. INVERTERS / POWER CONDITIONING UNIT (PCU)

- a. The PCU / Grid Tied Inverter shall carry a warranty of minimum 5years.
- b. Inverter/PCU shall be non-transformer string inverters, grid tied in nature, shall consist of MPPT controller. Inverters shall be decided based on array design/suitable rating in case of string design, associated control and protection devices etc all integrated into PCU. It shall provide necessary protections for Grid Synchronization. The Inverters should convert DC power produced by SPV modules in to AC power and must synchronize automatically its AC output to the exact AC Voltage and frequency of Grid.
- c. The DC energy produced has to be utilized to maximum and supplied to the bus for inverting to AC voltage to extract maximum energy from solar array and provides 3-ph,

400V AC/ (+10% to – 10%), 50+/-1.5 Hz with total harmonic voltage distortion less than 3% to synchronize with local grid.

- d. The Inverters shall be of very high quality having efficiency not less than 97% and shall be capable of running in integrated mode.
- e. Degree of protection of the indoor Inverters shall be at least IP-42 and that of outdoor at least IP-65.
- f. Built in with data logging to remotely monitor plant performance through external PC shall be provided (PC shall be provided along with SPV Plant).
- g. The Inverters should be designed to be completely compatible with the SPV array voltage and Grid supply voltage.
- h. The dimension, weight, foundation details etc. of the PCU shall be clearly indicated in the detailed technical specification.
- i. The PCU shall be capable of complete automatic operation, including wake-up, synchronization & shut down independently & automatically.
- j. Both AC & DC lines shall have suitable fuses & surge arrestors and Bidder/Bidding Consortium/Bidding Consortium/ss to allow safe start up and shut down of the system. Fuses used in the DC circuit should be DC rated.
- k. Inverters/PCU shall operate in sleeping mode when there will no power connected.
- l. Protections :
 - Over voltage both at input & output
 - Over current both at input & output
 - Over/under grid frequency
 - Heat sink over temperature
 - Short circuit
 - Protection against lightning
 - Surge arrestors to protect against Surge voltage induced at output due to external source
 - Anti- Islanding Protection
 - And other required protections

It should have user friendly LED/LCD or touch display for programming and view on line parameters such as:

 - Inverter per phase Voltage, current, kW, kVA and frequency,
 - Grid Voltage and frequency,
 - Inverter (Grid) on Line status,
 - PV panel voltage,
 - Solar charge current
 - Individual power stage heat sink and cabinet temperature,
 - Inverter Import export kWh summation
 - Solar kWh summation
 - Inverter on

- Grid on
 - Inverter under voltage/over voltage
 - Inverter over load
 - Inverter over temperature
- m. PCU shall be capable to synchronize independently & automatically with grid power line frequency to attain synchronization and export power generated by solar plant to grid.
- n. The PCU shall be capable of operating in parallel with the grid utility service and shall be capable of interrupting line fault currents and line to ground fault currents.
- o. The PCU shall be able to withstand an unbalanced load conforming to IEC standard (+/- 5% voltage) and relevant Indian electricity condition. The PCU shall include appropriate self- protective and self-diagnostic features to protect itself and the PV array from damage in the event of PCU component failure or from parameters – beyond the PCU's safe operating range due to internal or external causes. The self-protective features shall not allow signals from the PCU front panel to cause the PCU to be operated in a manner which may be unsafe or damaging. Faults due to malfunctioning within the PCU, including commutation feature, shall be cleared by the PCU protective devices and not by the existing site utility grid service circuit breaker.
- p. The Inverter shall go to shutdown/standby mode, with its contacts open, under the following conditions before attempting an automatic restart after an appropriate time delay.
- When the power available from the PV array is insufficient to supply the losses of the PCU, the PCU shall go to standby/shutdown mode.
 - The PCU control shall prevent excessive cycling of shut down during insufficient solar radiance.
- p. Operation outside the limits of power quality as described in the technical data sheet should cause the power conditioner to disconnect the grid. Additional parameters requiring automatic disconnection are
- Over current
 - Earth fault
 - And reverse power
 - In each of the above cases, tripping time should be less than a few seconds.
- q. Detailed technical description of the complete unit of offered Inverter should be furnished with bid document Following Technical documents of Inverter shall be supplied for approval after placement of order
- Detailed technical description of the complete unit
 - Instructions for installation and operation
 - Electrical diagrams of all internal cabling necessary for installation, maintenance and fault finding.
 - Description of electrical and mechanical characteristics of units
 - Maintenance and fault finding procedures.
 - Safety precautions
 - Software for data monitoring with detailed description.

- Details of data acquisition
 - Factory test reports in details on various parameters.
 - Trouble shooting procedures
 - All maintenance requirements and their schedules, including detailed instructions on how to perform each task.
 - Detailed schematics of all power instrumentation and control equipment and subsystems along with their interconnection diagrams. Schematics shall indicate wiring diagrams, their numbers and quantities, type and ratings of alt components and subsystems.
 - A detailed bill of materials which shall list components model numbers, quantities and manufacturer of each supplied item.
 - All documents and write ups shall be in English. They shall be clean and legible, and must be checked, signed, approved and dated by a competent representative of the Bidder/Bidding Consortium.
- r.** The Bidder/Bidding Consortium/Bidding Consortium should note that Inverters/PCU is going to be installed in an area which is prone to hot air of 48 to 50 degree centigrade. Thus the room shelters and air blower/ fan (auto operated as per requirement), if required, for Inverter will be in scope of supply. Integrated solutions into prefabricated structures or in standard metallic container may be accepted. The Bidder/Bidding Consortium/Bidding Consortium shall provide data sheet for Inverter/ Power Conditioning Unit along with their offer.
- s.** The PCU/ inverters should be tested from the MNRE approved test centers / NABL /BIS /IEC accredited testing- calibration laboratories. In case of imported power conditioning units, these should be approved by international test houses.
- t. MNRE latest additional guidelines for Inverters:**
- 1. The inverters should be tested as per IEC standards. The following criteria should be followed:**
 - i. The benchmarking efficiency criteria for Grid Tied (string inverters) inverter**
 - At nominal voltage and full load is $\geq 95\%$.
 - For load $\geq 25\%$ is $\geq 92\%$.
 - ii. In case of standalone / grid interactive inverter the bench marking efficiency criteria**
 - At full load is 85%
 - For the load $\geq 25\%$ is 80%
 - iii. No load losses should not be more than 5%.**
 - 2. The following tests are to be conducted on the inverters:**
 - a) Efficiency measurement as per IS/IEC 61683 (for system with no MPPT)**
 - b) Overall efficiency for Grid Tied inverter as per EN50530**
 - c) Islanding Prevention test as per IS 16169/IEC 62116**
 - d) PV system characteristics of utility interface as per IEC 61727 (the system should meet all the clauses as per the standard except the clause 5.2.2 of IEC 61727. In case of clause 5.2.2 it should withstand the over /under frequency in the range of 47 to 52Hz)**

- e) Overall charge controller efficiency should be $\geq 85\%$ at $\geq 10\%$ load and $\geq 92\%$ at full load.
- f) System should have IP 65 certification for outdoor use IP 21 & 22 for indoor use.
- g) Environmental testing as per IEC 60068-2-(1,2,14&30)

3. All the test laboratories should provide a clear cut verdict in the end of the test report regarding conformity / non conformity of the system against the standard / specifications for which it has been tested. Any discrepancy in the specifications of sample submitted, the test labs should specify the same in the report.

4. From 1st July' 2017 all test laboratories should start the data logging of all the test parameters during testing and soft copy of the same will be maintained for a period of 5years.

5. ENERGY METERING

Digital Communicable Energy Meters shall be provided for measuring power consumption by grid side loads on continuous basis and register the cumulative energy on 30-minute interval basis (Programmable/adjustable), daily, monthly and annually the energy generated. The Energy Meter shall have default display of Cumulative kWh. The following parameters to be displayed on-demand:

- a. The Energy Meter shall have 4-quadrant measurement method and shall be suitable for 3-wire as well as 4-wire connection.
- b. The meter shall also record Maximum Demand at set interval. TOD (Time of Day) measurement shall also be possible.
- c. The energy meter shall communicate with the Data Acquisition System / other plant network over MODBUS protocol.
- d. Separate Meters shall be provided for Solar Power Generation and Auxiliary load consumption.
- e. In case more than one inverter circuits are used for synchronizing with the grid then similar meters shall be provided for each inverter output circuit.
- f. Additionally one digital summator shall also be provided for calculation and display of total concurrent energy/ demand of all the feeders.
- g. Meters shall comply with the requirements of CEA Regulations on Installation & Operation of Meters.
- h. The functional Specification of the energy meters shall be as follows:
 - Applicable IS : IS 13779 or IS 14679 depending upon accuracy of meters.
 - Accuracy Class Index: 0.2S
 - Power factor range: Zero lag–unity-zero lead
 - Display parameters : LCD test, KWH import, KWH export, MD in KW export, MD in KW import, Date & Time, AC(phase wise and line wise) current and voltages and

- power factor and frequency (Cumulative KWH will be indicated continuously by default & other parameters through push-button) .
- Power Consumption: Less than 4VA in Voltage circuit and 2 VA for Current circuit.
 - Frequency: 50 Hz with + / -5% variation
 - Test Output Device: Flashing LED visible from the front
 - Billing data: Meter serial number, Date and time, KWH import, KWH export, MD in KW (both export and import), History of KWH import and export, & MD (both export & import).
 - All these data shall be accessible for reading, recording and spot billing by downloading through optical port/RS485 on MRI or Laptop computers at site.

6. INTEGRATION OF PV POWER WITH GRID:

The output power from SPV would be fed to the inverters 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. Once the DG set comes into service PV system shall again be synchronized with DG supply and load requirement would be met to the extent of availability of power. 4 pole isolation of inverter output with respect to the grid/ DG power connection need to be provided.

7. DATA ACQUISITION AND LOGGING

- i. Data Acquisition System shall be provided for each of the solar PV plant.
- ii. Data Logging Provision for plant control and monitoring, time and date stamped system data logs for analysis with the high quality, suitable PC. Metering and Instrumentation for display of systems parameters and status indication to be provided.
- iii. Solar Irradiance: An integrating Pyranometer / Solar cell based irradiation sensor (along with calibration certificate) provided, with the sensor mounted in the plane of the array. Readout integrated with data logging system.
- iv. Temperature: Temperature probes for recording the Solar panel temperature and/or ambient temperature to be provided complete with readouts integrated with the data logging system
- v. The following parameters are accessible via the operating interface display in real time separately for solar power plant:
 - a. AC Voltage.
 - b. AC Output current.
 - c. Output Power
 - d. Power factor.
 - e. DC Input Voltage.
 - f. DC Input Current.
 - g. Time Active.
 - h. Time disabled.
 - i. Time Idle.
 - j. Power produced
 - k. Protective function limits (Viz-AC Over voltage, AC Under voltage, Over frequency, Under frequency ground fault, PV starting voltage, PV stopping voltage.

- vi. All major parameters available on the digital bus and logging facility for energy auditing through the internal microprocessor and read on the digital front panel at any time) and logging facility (the current values, previous values for up to a month and the average values) should be made available for energy auditing through the internal microprocessor and should be read on the digital front panel.
- vii. PV array energy production: Digital Energy Meters to log the actual value of AC/DC voltage, Current & Energy generated by the PV system provided. Energy meter along with CT/PT should be of 0.5 accuracy class.
- viii. Computerized DC String/Array monitoring and AC output monitoring shall be provided as part of the inverter and/or string/array combiner box or separately.
- ix. String and array DC Voltage, Current and Power, Inverter AC output voltage and current (All 3 phases and lines), AC power (Active, Reactive and Apparent), Power Factor and AC energy (All 3 phases and cumulative) and frequency shall be monitored.
- x. Computerized AC energy monitoring shall be in addition to the digital AC energy meter.
- xi. The data shall be recorded in a common work sheet chronologically date wise. The data file shall be MS Excel compatible. The data shall be represented in both tabular and graphical form.
- xii. All instantaneous data shall be shown on the computer screen.
- xiii. Software shall be provided for USB download and analysis of DC and AC parametric data for individual plant.
- xiv. Provision for Internet monitoring and download of data shall be also incorporated.
- xv. Remote Server and Software for centralized Internet monitoring system shall be also provided for download and analysis of cumulative data of all the plants and the data of the solar radiation and temperature monitoring system.
- xvi. Ambient / Solar PV module back surface temperature shall be also monitored on continuous basis.
- xvii. Simultaneous monitoring of DC and AC electrical voltage, current, power, energy and other data of the plant for correlation with solar and environment data shall be provided.
- xviii. Remote Monitoring and data acquisition from ranging of 1kWp through Remote Monitoring System software at the Beneficiary department/TSREDCO location with latest software/hardware configuration and service connectivity for online / real time data monitoring/control complete to be supplied and operation and maintenance/control to be ensured by the supplier. Provision for interfacing these data on TSREDCO server and portal in future shall be kept.

8. POWER & CONTROL CABLES:

Cables of appropriate size to be used in the system shall have the following characteristics:

- i. Shall meet IEC 60227/IS 694, IEC 60502/IS1554 standards
- ii. Temp. Range: -10°C to $+80^{\circ}\text{C}$.
- iii. Voltage rating 660/1100V
- iv. Excellent resistance to heat, cold, water, oil, abrasion, UV radiation

- v. Flexible
- vi. Sizes of cables between array interconnections, array to junction boxes, junction boxes to Inverter etc. shall be so selected to keep the voltage drop (power loss) of the entire solar system to the minimum. The cables (as per IS) should be insulated with a special grade PVC compound formulated for outdoor use.
- vii. Cable Routing/ Marking: All cable/wires are to be routed in a GI cable tray and suitably tagged and marked with proper manner by good quality ferule or by other means so that the cable easily identified.
- viii. The Cable should be so selected that it should be compatible up to the life of the solar PV panels i.e. 25years.
- ix. The ratings given are approximate. Bidder to indicate size and length as per system design requirement. All the cables required for the plant provided by the bidder. Any change in cabling sizes if desired by the bidder/approved after citing appropriate reasons. All cable schedules/layout drawings approved prior to installation.
- x. Multi Strand, Annealed high conductivity copper conductor PVC type 'A' pressure extruded insulation or XLPE insulation. Overall PVC/XLPE insulation for UV protection Armored cable for underground laying. All cable trays including covers to be provided. All cables conform to latest edition of IEC/ equivalent BIS Standards as specified below: BoS item / component Standard. Description Standard Number Cables General Test and Measuring Methods, PVC/XLPE insulated cables for working Voltage up to and including 1100 V ,UV resistant for outdoor installation IS /IEC 69947.
- xi. The size of each type of DC cable selected shall be based on minimum voltage drop however; the maximum drop shall be limited to 1%.
- xii. The size of each type of AC cable selected shall be based on minimum voltage drop however; the maximum drop shall be limited to 2 %.

9. DC DISTRIBUTION BOARD:

- 9.1 DC Distribution panel to receive the DC output from the array field.
- 9.2 DC DPBs shall have sheet from enclosure of dust & vermin proof conform to IP 65 protection. The bus bars are made of copper of desired size. Suitable capacity MCBs/MCCB shall be provided for controlling the DC power output to the PCU along with necessary surge arrestors.

10. AC DISTRIBUTION PANEL BOARD:

- a) AC Distribution Panel Board (DPB) shall control the AC power from PCU/ inverter, and should have necessary surge arrestors. Interconnection from ACDB to mains at LT Bus bar while 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

11. PCU/ARRAY SIZE RATIO:

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

12. EARTHING AND LIGHTNING PROTECTION SYSTEM

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

12.1. LIGHTNING PROTECTION

The SPV power plants shall be provided with lightning & overvoltage protection. The main aim in this protection shall be to reduce the over voltage to a tolerable value before it reaches the PV or other sub system components. The source of over voltage can be lightning, atmosphere disturbances etc. The entire space occupying the SPV array shall be suitably protected against Lightning by deploying required number of Lightning Arrestors. Lightning protection should be provided as per IEC 62305 standard. The protection against induced high-voltages shall be provided by the use of metal oxide varistors (MOVs) and suitable earthing such that induced transients find an alternate route to earth.

12.2. SURGE PROTECTION

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

12.3. EARTHING PROTECTION

- i. Each array structure of the PV yard should be grounded/ earthed properly as per IS:3043-1987. In addition the lightning arrester/masts should also be earthed inside the array field. Earth Resistance shall be tested in presence of the representative of Department/TSREDCO as and when required after earthing by calibrated earth tester. PCU, ACDB and DCDB should also be earthed properly.

- ii. Earth resistance shall not be more than 5 ohms. It shall be ensured that all the earthing points are bonded together to make them at the same potential.

12.4. GRID ISLANDING:

- i. 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.
- ii. A manual disconnect 4pole 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 by the utility personnel

13. POWER CONSUMPTION:

Regarding the generated power consumption, priority need to give for internal consumption first and thereafter any excess power can be exported to grid. Finalization of tariff is not under the purview of TSREDCO or MNRE. Decisions of appropriate authority like DISCOM, state regulator may be followed.

14. CIVIL WORKS

This section of the specification covers entire civil engineering work for technological structures, new equipment and facilities for all production, auxiliary and ancillary units, foundation for all structures and main equipment described elsewhere in this specification on a Turnkey basis for installation of the Solar PV power plant.

The scope shall cover complete civil engineering work for the proposed plant within its battery limit, on turnkey basis including design, supply of all materials and execution.

15. PROJECT SCHEDULE & PROGRESS MONITORING

Bidder/Bidding Consortium shall submit Overall schedule along with the offer. The overall schedule should be planned in weeks. The heads to be covered in the schedules shall broadly be as follows:

- i. Basic engineering and approval
- ii. Preparation and issue of ordering / technical specifications for sub vendors
- iii. Placement of orders on sub-vendors
- iv. Detailed design and engineering
- v. Submission and approval of drawings for civil & structural works
- vi. Manufacture and supply of all equipment/ piping/ cables, etc
- vii. Fabrication and supply of building and technological structures
- viii. Submission and approval of erection drawings and manuals
- ix. Erection of building and technological structures

- x. Erection of equipment, piping, cables, etc.
- xi. Testing and commissioning

The major milestones for the project are to be highlighted in the schedule. The Bidder/Bidding Consortium shall submit an overall erection plan for the plant and equipment under his scope of supply along with the tender.

The successful Bidder/Bidding Consortium shall have to submit the Level-II network schedule both in hard and editable soft copy (in MS Project/Primavera) covering further details of construction, fabrication and erection activities, area-wise, for approval and finalization of the Employer / Consultant. The format of progress report to be discussed and agreed.

The Bidder/Bidding Consortium/Bidding Consortium has to clearly specify to complete the work as per terms and conditions of agreement.

16. DRAWINGS, DATA AND DOCUMENTS

The Bidder/Bidding Consortium shall furnish following documents/ information along with the offer.

- General description of equipment offered specifying the important features, make, technical parameters, materials of construction, etc. to enable the owner to have proper understanding of the equipment offered and its operation.
- Technical literature, catalogue and publications
- Layout of Complete Power Plant Installation showing location of all major sub-systems
- Single line diagrams of all systems and sub systems of the entire power plant including that of the MMS structures.
- Typical general arrangement and foundation details
- General lighting scheme
- Type tests certificates of all major equipments like switchgear, Inverters, Solar Modules etc.
- Single line schematic diagram of electrical system for grid interfacing and grid interconnection from Solar plant
- General arrangement drawings and circuit diagrams of Module, Inverters, Transformers, and overall solar plant arrangement
- The Bidder/Bidding Consortium shall submit a list of all drawings and documents proposed to be submitted. The list will be approved by employer/ consultant and may be modified if necessary
- Each drawing/ documents in the list shall be identified with a serial number, description and scheduled date of submission.

For Approval :

- Equipment layout plan
- Single line diagram with rating of all equipment, cable sizes and details of protection and metering
- Front view, general arrangement of equipment with plan and sectional views; clearly showing the position of various components, and clearance between components. The make and type of components, together with vital technical parameters shall also be furnished along with GA drawings

- Control, alarm, indications, interlocking and other schematics
- Lighting layout drawings with illumination levels, type and make of fittings.
- Wiring terminal plan drawings with cable connections
- Earthing scheme and layout of earthing network with design calculations, for outdoor switch yard and other areas/premises, if applicable.
- Cable layout drawings, cable channels details
- Installation drawings of all equipment with layout of equipment, cables, lighting systems, (if applicable) and earthing network.
- Calculation for design of LT busduct, sizing of busbars, busbar supports considering the temperature rise and fault current.
- Calculations for design of supporting structures for outdoor switchyard w.r.t. wind pressure, short circuit forces etc. (if applicable).

Instruction Manuals for Operation & Maintenance

- Complete and comprehensive instruction manuals for operation and maintenance of the equipment with drawings. This shall include the following:
- Preventive maintenance schedule for each equipment
- Procedure for shut down and start-up of the entire power plant
- Safety procedures for safe operation of equipment and complete system
- Specification of equipments installed.
- Test procedure for site tests

Upon installation and commissioning supplier shall incorporate revisions/ modifications if any in the reproducible and submit 'as built' drawings for employer's record as per general condition of contract.

17. DELIVERY

The completion period of the project is limited to 4 months. No further extension shall be provided except under Force Majeure.

18. INSTALLATION GUIDELINES

- All the electrical installations shall conform to the Indian Electricity Act, Indian Electricity Rules, and regulations.
- The mechanical and Civil installation shall conform to the applicable Acts and Rules of corresponding Inspectorate and other relevant authorities, if any.
- Provision of cable glands, ferrules, cable lugs, tags, sealing kits shall be arranged.
- Supply and installation of first aid boxes, shock treatment charts, rubber mats, and key board etc.
- Erection, testing and commissioning of various equipment shall be done strictly as per manufacturer's instructions.
- Cables shall be laid in conduits as per the electrical installation procedures
- The minimum bending radius of cables shall be 12D and 15D for LT and LT cable respectively.
- Interplant cable shall be laid to trenches, tunnel or overhead structure as per site condition. Digging and refilling of cable trenches, required erection accessories shall be in the scope of work of the Bidder/Bidding Consortium.

- Cable shall be fixed to cable racks or cable trays or run on cleats or in conduits, which shall be fixed to concrete brick work or steel structure as required for proper support of the cables, easy accessibility and neatness of appearance.
- Perforated trays shall be provided for control cables.
- Approved type of danger boards, boards inscribing 'ISOLATED', 'DO NOT CLOSE, MEN AT WORK' in English, Telugu, Hindi and Local languages shall be provided in sufficient numbers.
- Special care shall be taken to make the enclosed equipment protected against entry of rats, lizard, and creeping reptiles which may create electrical short circuits.
- Approved cable markers of reinforced concrete shall be provided and fixed to mark each and every diversion of all buried cable routes. A marker shall also be placed every 50 meters along straight portions of each route. A concrete cable marker shall also be provided and fixed to mark the position of every buried joints.
- Distinguishing labels of non-corrodible material marked in accordance with the cable numbers of the cabling diagram shall be permanently attached to each end of every cable. The phase or polarity of each power cable core at the cable ends shall be identified.
- Mounting of Inverters, Electrical panels, Dc and Ac junction boxes, Monitoring systems shall be done with proper mounting procedures with neat look.

19. ERECTION, TESTING, COMMISSIONING

The scope of work of the Bidder/Bidding Consortium shall be complete erection of the equipment, cables, auxiliary systems and sub systems under the scope of work. The Bidder/Bidding Consortium shall make all arrangements to deliver the equipment at site by wagons/ trucks/ trailers, build his own stores (covered, uncovered, air-conditioned, if necessary) for the proper storage of equipment, maintain the stores and all related documents and records, transport the equipment to site for erection purpose. The Bidder/Bidding Consortium also shall make all security arrangements.

- The Bidder/Bidding Consortium shall be responsible for proper, quick retrievable and neat storage and also undertake the conservation of all consignments including damaged boxes. During storage of equipment, the Bidder/Bidding Consortium shall take into account deterioration and carry out the re-conservation of the complete equipment/parts/supplies as may be necessary as per the storage instructions of the Manufacturer of equipment/ components. The Bidder/Bidding Consortium shall also supply the consumables required for such re-conservation work and repair/ replace parts required thereof for the proper functioning of the equipment after erection and commissioning.
- The Bidder/Bidding Consortium shall retrieve the equipment/ materials from stores and transport the same to erection site.
- The Bidder/Bidding Consortium shall unpack and do visual checking against physical damages to the equipment/cases, clean equipment before start of erection. Damage/ shortage, if any, shall be reported to the Employer/ Consultant and shall be rectified/replaced expeditiously, so as not to upset the erection and commissioning schedule.
- The Bidder/Bidding Consortium shall provide all necessary erection equipment and tools & tackles including material handling equipment, cranes, compressors and other equipment and instruments and consumables, all commissioning equipment and instruments, welding equipment, winches, alignment tools, precision levels, etc., which

may be required for carrying out the erection and commissioning work efficiently.

- All instruments shall be properly calibrated before use. Unless otherwise specified, the above erection equipment/ materials shall be the property of the Bidder/Bidding Consortium. However, Employer's prior permission shall be required for removal of these erection equipment/ materials from the site. The Bidder/Bidding Consortium shall ensure that proper procedure and documentation is maintained at entry gate of Employer's premises for such items as might be carried back by the Bidder/Bidding Consortium after completion of work.
- The Bidder/Bidding Consortium shall provide erection consumables like oxygen and acetylene gas, welding rods, solder lugs, oil, grease, kerosene, cotton waste, etc. required for erection of equipment and steel structures.
- The Bidder/Bidding Consortium shall construct and maintain his own site offices and stores as required for the work and arrange for maintaining in the area placed at the Bidder/Bidding Consortium's disposal in a neat manner.
- The Bidder/Bidding Consortium shall provide his scheme for mobilization with Bar Chart indicating clearly the resources, manpower and machinery proposed to be deployed to ensure timely completion of work and quality of workmanship
- On request, the Employer may help the Bidder/Bidding Consortium by providing any special handling/construction equipment needed in the interest of work subject to availability and on payment of hire charges and other conditions of Employer. The charges shall be recovered from any bill of the Bidder/Bidding Consortium due immediately thereafter.
 - All safety, health and pollution control measures as required to be adopted as per the Statutory Regulations and the Safety conditions for Bidder/Bidding Consortia issued along with the tender or otherwise required or implied by statutory regulations or practices shall be strictly followed by the Bidder/Bidding Consortium during the execution of the Contract. The Bidder/Bidding Consortium shall set up a suitable safety organization of his own at site in this regard.
- Labor facilities such as shelter, food shall be arranged by the Bidder/Bidding Consortium. On request drinking water shall be provided by the employer.
- The Employer shall deploy/supply Supervising/operating & maintenance personnel and all raw materials, utilities & services required for commissioning.
- Auxiliary power supply facility for system testing & commissioning, Inverter auxiliary, luminaries, control room, Inverter room, site office and other power consuming areas shall be provided by the Employer
- The results of pre commissioning Test, start-up tests and commissioning report shall be recorded jointly by the Bidder/Bidding Consortium and the TSREDCO. And a cumulative report shall be duly submitted by the Bidder/Bidding Consortium to
- The Bidder/Bidding Consortium shall rectify the defects observed during the Commissioning period promptly.
- Successfully commissioning as accepted if the complete system remains synchronized with the grid for a period of 48 hours without any disturbance or interruption. During this period the system shall generate power during sunshine hours and export power to the grid and during dark hours shall remain synchronized with the grid. If there is an outage isolation from the grid during this period due to defects in the system, then commissioning period shall start afresh after rectification of the said defect. However if the ambient or the grid parameter are beyond the specified limits if any shall not be considered as stoppage.
- The Commissioning and project completion certificate shall be issued by the Employer

subject to relevant conditions.

20. CONNECTIVITY

The maximum capacity for interconnection with the grid at a specific voltage level shall be as specified in the Distribution Code/Supply Code of the State and amended from time to time. Following criteria have been suggested for selection of voltage level in the distribution system for ready reference of the solar suppliers.

Plant Capacity	Connecting voltage
Up to 10KW	230- Single Phase or 415V – three phase at the option of the consumer/ beneficiary
10kW and up to 100 kW	415V – three phase
Above 100kW	At HT/EHT level (11kV/33kV/66kV) as per DISCOM rules

- The maximum permissible capacity for rooftop shall be 1 MW for a single net metering point.
- Utilities may have voltage levels other than above, DISCOMS may be consulted before finalization of the voltage level and specification be made accordingly.
- For large PV system (Above 100 kW) for commercial installation having large load, the solar power can be generated at low voltage levels and stepped up to 11 kV level through the step up transformer. The transformers and associated switchgear would require to be provided by the SPV bidders.

21. TOOLS & TACKLES AND SPARES:

- After completion of installation & commissioning of the power plant, necessary tools & tackles are to be provided free of cost by the bidder for maintenance purpose. List of tools and tackles to be supplied by the bidder for approval of specifications and make from TSREDCO
- A list of requisite spares in case of PCU/inverter comprising of a set of control logic cards, IGBT driver cards etc. Junction Boxes. Fuses, MOVs / arrestors, MCCBs etc along with spare set of PV modules be indicated, which shall be supplied along with the equipment. A minimum set of spares shall be maintained in the plant itself for the entire period of warranty and Operation & Maintenance which upon its use shall be replenished

22. DANGER BOARDS AND SIGNAGES:

Danger boards should be provided as and where necessary as per IE Act. /IE rules as amended up to date. Three signage shall be provided one each at battery –cum- control room, solar array area and main entry from concerned building/block. Text of the signage may be finalized in consultation with TSREDCO/ Beneficiary Department.

23. FIRE EXTINGUISHERS:

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

- a) Portable fire extinguishers in the control room for fire caused by electrical short circuits
- b) Sand buckets in the control room
- c) The installation of Fire Extinguishers should confirm to TAC regulations and BIS standards. The fire extinguishers shall be provided in the control room housing PCUs as well as on the Roof or site where the PV arrays have been installed.

24. Technical Specifications :

- 1) The Solar panels to be used in this project should be from Indian manufacturers certified by the Ministry of New & Renewable Energy (MNRE).
- 2) The SPV panels shall carry a warranty of minimum 25years.
- 3) The SPV panel must be warranted for their output peak watt capacity which shall not be less than 90% at the end of 10years and 80% at the end of 25years.
- 4) In addition any components those are to be used in the project should have the certification of MNRE.

25. PLANNING AND DESIGNING:

- i. The bidder should carry out Shadow Analysis at the site and accordingly design strings & arrays layout considering optimal usage of space, material and labor. The bidder should submit the array layout drawings along with Shadow Analysis Report to TSREDCO for approval.
- ii. TSREDCO reserves the right to modify the landscaping design, Layout and specification of sub-systems and components at any stage as per local site conditions/requirements.
- iii. The bidder shall submit preliminary drawing for approval & based on any modification or recommendation, if any. The bidder submits three sets and soft copy in CD of final drawing for formal approval to proceed with construction work.

26. TRANSFORMER “IF REQUIRED” & METERING:

- i. Dry/oil type relevant kVA, 11kV/415V, 50 Hz Step up along with all protections, switchgears, Vacuum circuit breakers, cables etc. along with required civil work.
- ii. The bidirectional electronic energy meter as per the requirement shall be installed for the measurement of import/Export of energy.
- iii. The bidder must take approval/NOC from the Concerned DISCOM for the connectivity, technical feasibility, and synchronization of SPV plant with distribution network and submit the same to TSREDCO before commissioning of SPV plant.
- iv. Reverse power relay shall be provided by bidder (if necessary), as per the local DISCOM requirement.

27. CORRESPONDENCE

Bidder requiring any clarification on bid documents may contact in writing or by Fax /E Mail.

Sl.No	Designation	Contact Numbers	Email id
1.	General Manager	040 – 23201502/03	info@tsredco.telangana.gov.in
2.	Project Director	040 – 23201502/03	se@tsredco.telangana.gov.in

28. PENALTY FOR DELAY IN PROJECT IMPLEMENTATION

If the bidder fails to commission the allocated capacity within 30 to 90days from date of issue of allocation letter, Penalty on per day basis calculated for the Performance Security on a 30 to 90days period would be levied. After 90days allocated capacity will get cancelled and the PBG amount pro-rata to non-commissioned capacity would be forfeited.

Example: If a project of 500 kW is delayed by 36 days then the LD will be levied as given below.

$$\text{PENALTY} = ((\text{Performance Security})/60 \text{ days}) * \text{delayed days} = (15,00,000 /60)*36$$

29. FORCE MAJEURE

- 29.1 Notwithstanding the provisions of clauses contained in this BID document; the contractor shall not be liable to forfeit
- Security deposit for delay and
 - Termination of contract; if he is unable to fulfill his obligation under this contract due to force majeure conditions.
- 29.2 For purpose of this clause, "Force Majeure" means an event beyond the control of the contractor and not involving the contractor's fault or negligence and not foreseeable, either in its sovereign or contractual capacity. Such events may include but are not restricted to Acts of God, wars or revolutions, fires, floods, epidemics, quarantine restrictions and fright embargoes etc. Whether a "Force majeure" situation exists or not, shall be decided by TSREDCO and its decision shall be final and binding on the contractor and all other concerned.
- 29.3 In the event that the contractor is not able to perform his obligations under this contract on account of force majeure, he will be relieved of his obligations during the force majeure period. In the event that such force majeure extends beyond six months, TSREDCO has the right to terminate the contract in which case, the security deposit shall be refunded to him.
- 29.4 If a force majeure situation arises, the contractor shall notify TSREDCO in writing promptly, not later than 14 days from the date such situation arises. The contractor shall notify TSREDCO not later than 3 days of cessation of force majeure conditions. After examining the cases, TSREDCO shall decide and grant suitable additional time for the completion of the work, if required.

30. TERMINATION:

The contract can be terminated

- a. by either without cause, after giving to the other party at least two calendar months' written notice thereof
- b. By the Employer, if the Tenderer/Service Provider fails to fulfill their tasks to the satisfaction of the Employer. Such failures constitute a breach of the Tenderer / Service Provider's obligations under contract, which are not remedied within 30 days from the date of giving of written notice requiring such breach to be remedied.

31. DISPUTES:

- 31.1 If any dispute of any kind whatsoever arises between TSREDCO and Successful bidder in connection with or arising out of the contract including without prejudice to the generality of the foregoing, any question regarding the existence, validity or termination, the parties shall seek to resolve any such dispute or difference by mutual consent.
- 31.2 If the parties fail to resolve, such a dispute or difference by mutual consent, within 45 days of its arising, then the dispute shall be referred by either party by giving notice to the other party in writing of its intention to refer to arbitration as hereafter provided regarding matter under dispute. No arbitration proceedings will commence unless such notice is given. Any dispute in respect of which a notice of intention to commence arbitration has been given in accordance with Sub Clause shall be finally settled by arbitration.
- 31.3 In all other cases, any dispute submitted by a party to arbitration shall be heard by an arbitration panel composed of three arbitrators, in accordance with the provisions set forth below.
- 31.4 The TSREDCO and the Contractor shall each appoint one arbitrator, and these two arbitrators shall jointly appoint a third arbitrator, who shall chair the arbitration panel. If the two arbitrators do not succeed in appointing a third arbitrator within Thirty (30) days after the latter of the two arbitrators has been appointed, the third arbitrator shall, at the request of either party, be appointed by the Appointing Authority for third arbitrator which shall be the President, Institution of Engineers.
- 31.5 If one party fails to appoint its arbitrator within thirty (30) days after the other party has named its arbitrator, the party which has named an arbitrator may request the Appointing Authority to appoint the second arbitrator.
- 31.6 If for any reason an arbitrator is unable to perform its function, the mandate of the Arbitrator shall terminate in accordance with the provisions of applicable laws as mentioned in Clause 23 (Applicable Law) and a substitute shall be appointed in the same manner as the original arbitrator.
- 31.7 Arbitration proceedings shall be conducted with The Arbitration and Conciliation Act, 1996. The venue or arbitration shall be New Delhi.
- 31.8 The decision of a majority of the arbitrators (or of the third arbitrator chairing the arbitration panel, if there is no such majority) shall be final and binding and shall be enforceable in any court of competent jurisdiction as decree of the court. The parties thereby waive any objections to or claims of immunity from such enforcement.
- 31.9 The arbitrator(s) shall give reasoned award.
- 31.10 Notwithstanding any reference to the arbitration herein, the parties shall continue to perform their respective obligations under the agreement unless they otherwise agree. Cost of arbitration shall be equally shared between the Successful bidder or Contractor and TSREDCO.

32. COST OF BIDDING

The bidder shall bear all the costs associated with the preparation and submission of his offer, and the company will in no case be responsible or liable for those costs, under any conditions. The Bidder shall not be entitled to claim any costs, charges and expenses of and incidental to or incurred by him through or in connection with his submission of bid even though TSREDCO may elect to modify / withdraw the invitation of Bid.

33. RIGHT TO WITHDRAW THE BID AND TO REJECT ANY BID

- 33.1 This BID may be withdrawn or cancelled by the TSREDCO at any time without assigning any reasons thereof. The TSREDCO further reserves the right, at its complete discretion, to reject any or all of the Bids without assigning any reasons whatsoever and without incurring any liability on any account.
- 33.2 The TSREDCO reserve the right to interpret the Bid submitted by the Bidder in accordance with the provisions of the BID and make its own judgment regarding the interpretation of the same. In this regard the TSREDCO shall have no liability towards any Bidder and no Bidder shall have any recourse to the TSREDCO with respect to the selection process. TSREDCO shall evaluate the Bids using the evaluation process specified in Section -I, at its sole discretion. TSREDCO decision in this regard shall be final and binding on the Bidders.
- 33.3 TSREDCO reserves its right to vary, modify, revise, amend or change any of the terms and conditions of the Bid before submission. The decision regarding acceptance or rejection of bid by TSREDCO will be final.

34. ZERO DEVIATION

This is a ZERO Deviation Bidding Process. Bidder is to ensure compliance of all provisions of the Bid Document and submit their Bid accordingly. Tenders with any deviation to the bid conditions shall be liable for rejection.

35. EXAMINATION OF BID DOCUMENT

- 35.1 The Bidder is required to carefully examine the Technical Specification, terms and Conditions of Contract, and other details relating to supplies as given in the Bid Document.

- 35.2 The Bidder shall be deemed to have examined the bid document including the agreement/contract, to have obtained information on all matters whatsoever that might affect to execute the project activity and to have satisfied himself as to the adequacy of his bid. The bidder shall be deemed to have known the scope, nature and magnitude of the supplies and the requirements of material and labour involved etc. and as to all supplies he has to complete in accordance with the Bid document.
- 35.3 Bidder is advised to submit the bid on the basis of conditions stipulated in the Bid Document. Bidder's standard terms and conditions if any will not be considered. The cancellation / alteration / amendment / modification in Bid documents shall not be accepted by TSREDCO
- 35.4 Bid not submitted as per the instructions to bidders is liable to be rejected. Bid shall confirm in all respects with requirements and conditions referred in this bid document.

36. FINAL DECISION AND FINAL CERTIFICATE:

Upon completion of 5 years of O&M and subject to the beneficiary department officials being satisfied, the TSREDCO shall give a certificate herein referred to as the Final Certificate to that effect and the Successful bidder to have fulfilled the whole of his obligations under Contract.

FINANCIAL BID
(On the official Letterhead of the firm)
SECTION-F

PRICE BID

(To be submitted in a separate envelope)

**Design, Supply, Installation, Commissioning, Maintenance and Operation of Grid
Connected Solar Rooftop Systems in various Govt. Buildings in Telangana State
Under RESCO MODE**

PROJECTS UNDER ACHIVEMENT LINKED INCENTIVES SCHEME:

Project Category	Levellised cost for supply of power for 25 years from Grid Connected Rooftop Solar PV Power Plant as per MNRE/TSREDCO/TRANSCO/DISCOM Specifications under Net Metering Scheme under RESCO MODE (Rs./KWh)	
	In Figures	In Words
01 to 10 kWp		
11 to 100 kWp		
Above 100 kWp		

Certified that:

1. The bidder has to quote unit rate only and will be uniform for the entire 25 years period.
2. Above rates are in accordance with specifications & various terms & conditions mentioned in the tender document.
3. The rates are inclusive of all taxes and duties of Govt. of Telangana as well Govt. of India prevailing from time to time.
4. Amount shall be quoted in INR / kWh up to two decimal places.
5. In the event of any discrepancy between the values entered in figures and in words, the values entered in words shall be considered.

Authorized Signature:

Name:

Designation:

Name & Address of the
Company/Consortium

SECTION –G
FORMATS FOR SUBMITTING BID

Format-I

Covering Letter

(The covering letter should be on the Letter Head of the Bidding Company)

BIDDERS UNDERTAKING COVERING LETTER

(Letter shall be submitted on Bidder(s) Letter Head)

Ref No:

Date:

To

The V.C & Managing Director

Telangana State Renewable Energy Development Corporation Limited (TSREDCO)

Corporate Office: D.No. 6-2-910, Visvesvaraya Bhavan,

The Institution of Engineers Building, Khairatabad, Hyderabad - 500 004.

Telangana State, India

Dear Sir,

Sub: Design, Supply, Installation, Commissioning, Maintenance and Operation of Grid connected Solar Power plants under State Net Metering Policy- reg.

Tender Reference: TSREDCO/SE/5MW/RESCO/RC/SPV1 - 1000 kWp/2018-19, Dated: 24.09.2018

1. We have examined the Tender for Supply, Installation and Commissioning of Grid connected Solar Power plants as specified in the Tender. We undertake to meet the requirements and services as required and as set out in the Tender document.
2. We attach our Technical Bid and Financial Bid in separate sealed covers as required by the Tender both of which together constitute our proposal, in full conformity with the said Tender.
3. We have read the provisions of Tender and confirm that these are acceptable to us. We further declare that additional conditions, variations, deviations, if any, found in our response shall not be given effect to.
4. We undertake, if our Bid is accepted, to adhere to the requirements as specified in the Tender or such modified plan as may subsequently be agreed.
5. We agree to unconditionally accept all the terms and conditions set out in the Tender document and also agree to abide by this Bid response for a period as mentioned in the Tender from the date fixed for bid opening and it shall remain binding upon us with full force and virtue, until within this period a formal contract is prepared and executed, this Bid response, together with your written acceptance thereof in your notification of empanelment, shall constitute a binding contract between us and TSREDCO.
6. We affirm that the information contained in the Technical Bid or any part thereof, including its schedules, and other documents, etc., delivered or to be delivered to TSREDCO is true, accurate, and complete. This proposal includes all information necessary to ensure that the statements therein do not in whole or in part mislead TSREDCO as to any material fact.
7. We also agree that you reserve the right in absolute sense to reject all or any of the products/ service specified in the bid response without assigning any reason whatsoever.

8. It is hereby confirmed that I/We are entitled to act on behalf of our company/ organization and empowered to sign this document as well as such other documents, which may be required in this connection.

9. We agree to use only indigenous PV modules in this project.

10. We also declare that our Company/Organisation is not blacklisted by any of the State or Central Government and organisations of the State or Central Government.

11. We undertake to use the BOS components other than PV Modules and Solar grid tie Inverters as per the standards stipulated.

Signature of the authorised person:

Name of the authorised person:

Designation:

Name and Address of Bidder

Stamp of bidder

CERTIFICATE AS TO AUTHORISED SIGNATORIES

I, certify that I am (Name) (Designation), and that (Name)..... who signed the above Bid has been duly authorized to sign the same on behalf of our Organisation.

Date:

Signature:

Seal:

FORMAT FOR BANK GUARANTEE FOR - EARNEST MONEY DEPOSIT

This deed of Guarantee made on..... day of Month & Year by Name & Address of the bank (hereinafter called the „GUARANTOR“) on the one part, on behalf of M/s Name & address of the Firm (hereinafter called the “Firm“) in favour of VC& Managing Director, TSREDCO, Hyderabad on the following terms and conditions.

Whereas the FIRM is submitting its tender for (Name of the work) and this guarantee is being made for the purpose of submission of Earnest money deposit with the tender document.

Know all people by these presents that the GUARANTOR, hereby undertake to indemnify and keep TSREDCO indemnified up to the extent of Rs.....during the validity of this bank guarantee and authorize TSREDCO to recover the same directly from the GUARANTOR. This bank guarantee herein contained shall remain in full force and effect till the expiry of its validity or till any extended period (if extended by the bank on receiving instructions from FIRM.). The liability under the guarantee shall be binding on the GUARANTOR or its successors.

Whereas the GUARANTOR further agrees that their liability under this guarantee shall not be affected by any reason of any change in the offer or its terms and conditions between the FIRM and TSREDCO with or without the consent or knowledge of the GUARANTOR.

Whereas the GUARANTOR further agrees to pay guaranteed amount hereby under or part thereof, on receipt of first written demand whenever placed by TSREDCO during the currency period of this guarantee. The GUARANTOR shall pay TSREDCO immediately without any question, demure, reservation or correspondence.

Whereas the GUARANTOR hereby agrees not to revoke this guarantee bond during its currency period except with the previous consent of TSREDCO in writing.

Notwithstanding anything contained herein

1. Our liability under this bank guarantee shall not exceed Rs.
2. This Bank guarantee shall be valid up to
3. We are liable to pay the guaranteed amount or any part thereof under this bank guarantee only and only against the written claim or demand on or before Sealed with the common seal of the bank on thisday of Month and Year

Witness :

1.

2

(Signature and seal of Bank)

FORMAT FOR PERFORMANCE BANK GUARANTEE (PBG)

{To be submitted for the Allocated capacity in different locations of Telangana state at the time of Project allocation separately}

(To be on non-judicial stamp paper of appropriate value as per Stamp Act relevant to place of execution.)

In consideration of the ----- [Insert name of the Bidder] (hereinafter referred to as selected Solar Power Developer') submitting the response to Tender inter alia for selection of the Project **under RESCO MODE** of the capacity of ____ kWp / MWp, at[Insert location details] under Roof Top scheme in response to the Tender no.....dated..... issued by Telangana State Renewable Energy Development Corporation Limited (hereinafter referred to as TSREDCO) and TSREDCO considering such response to the Tender of[insert the name of the selected Solar Power Developer] (which expression shall unless repugnant to the context or meaning thereof include its executors, administrators, successors and assignees) and selecting the Solar Power Project of the Solar Power Developer and issuing Letter of allocation No ----- to (Insert Name of selected Solar Power Developer) as per terms of Tender and the same having been accepted by the selected SPD or a Project Company, M/s -----

----- {a Special Purpose Vehicle (SPV) formed for this purpose}, if applicable]. As per the terms of the Tender, the

_____ [insert name & address of bank] hereby agrees unequivocally, irrevocably and unconditionally to pay to TSREDCO at [Insert Name of the Place from the address of the TSREDCO] forthwith on demand in writing from TSREDCO or any Officer authorized by it in this behalf, any amount up to and not exceeding Rupees----- [Total Value] only, on behalf of M/s _____ [Insert name of the selected Solar Power Developer / Project Company]

This guarantee shall be valid and binding on this Bank up to and including..... and shall not

be terminable by notice or any change in the constitution of the Bank or the term of contract or by any other reasons whatsoever and our liability hereunder shall not be impaired or discharged by any extension of time or variations or alternations made, given, or agreed with or without our knowledge or consent, by or between parties to the respective agreement.

Our liability under this Guarantee is restricted to Rs. _____

Our Guarantee shall remain in force until..... TSREDCO shall be entitled to invoke this Guarantee till

The Guarantor Bank hereby agrees and acknowledges that TSREDCO shall have a right to invoke this BANK GUARANTEE in part or in full, as it may deem fit.

The Guarantor Bank hereby expressly agrees that it shall not require any proof in addition to the written demand by TSREDCO, made in any format, raised at the above mentioned address of the Guarantor Bank, in order to make the said payment to TSREDCO.

The Guarantor Bank shall make payment hereunder on first demand without restriction or conditions and notwithstanding any objection by -----[Insert name of the selected bidder].

The Guarantor Bank shall not require TSREDCO to justify the invocation of this BANK GUARANTEE, nor shall the Guarantor Bank have any recourse against TSREDCO in respect of any payment made hereunder

This BANK GUARANTEE shall be interpreted in accordance with the laws of India and the courts at Delhi shall have exclusive jurisdiction.

The Guarantor Bank represents that this BANK GUARANTEE has been established in such form and with such content that it is fully enforceable in accordance with its terms as against the Guarantor Bank in the manner provided herein.

This BANK GUARANTEE shall not be affected in any manner by reason of merger, amalgamation, restructuring or any other change in the constitution of the Guarantor Bank.

This BANK GUARANTEE shall be a primary obligation of the Guarantor Bank and accordingly TSREDCO shall not be obliged before enforcing this BANK GUARANTEE to take any action in any court or arbitral proceedings against the selected Solar Power Developer / Project Company , to make any claim against or any demand on the Successful bidder or to give any notice to the selected Solar Power Developer / Project Company or to enforce any security held by TSREDCO or to exercise, levy or enforce any distress, diligence or other process against the selected Solar Power Developer / Project Company .

Notwithstanding anything contained hereinabove, our liability under this Guarantee is restricted to Rs. _____ (Rs. _____ only) and it shall remain in force until We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only if TSREDCO serves upon us a written claim or demand.

Signature _____

Name _____

Power of Attorney No. _____

For _____ [Insert Name of the Bank] _____ Banker's Stamp and Full Address.

Dated this ____ day of ____, 20__

Witness:

1.

2.

Signature

Signature

Name and Address

Name and Address

Notes:

1. The Stamp Paper should be in the name of the Executing Bank and of Appropriate value.
2. The Performance Bank Guarantee (PBG) shall be executed by any scheduled Bank

FORMAT FOR BID SECURITY

(To be on non-judicial stamp paper of appropriate value as per Stamp Act relevant to place of execution.)

Ref. _____

Bank Guarantee No. _____

Date: _____

In consideration of the -----[Insert name of the Bidder] (hereinafter referred to as 'Bidder') submitting the response to Tender inter alia for selection of the Project **under RESCO route** of the capacity of ____ MWp in the Telangana. State for the districts as indicated in Tender) in response to the Tender No. _____ dated ____ issued by Telangana State Renewable Energy Development Corporation Limited (hereinafter referred to as TSREDCO) and TSREDCO considering such response to the Tender of[insert the name of the Bidder] as per the terms of the Tender, the _____ [insert name & address of bank] hereby agrees unequivocally, irrevocably and unconditionally to pay to TSREDCO at [Insert Name of the Place from the address of TSREDCO] forthwith on demand in writing from TSREDCO or any Officer authorized by it in this behalf, any amount up to and not exceeding Rupees ----- only, on behalf of M/s. _____ [Insert name of the Bidder]

This guarantee shall be valid and binding on this Bank up to and including _____[insert date of validity in accordance with condition of this Tender] and shall not be terminable by notice or any change in the constitution of the Bank or the term of contract or by any other reasons whatsoever and our liability hereunder shall not be impaired or discharged by any extension of time or variations or alternations made, given, or agreed with or without our knowledge or consent, by or between parties to the respective agreement.

Our liability under this Guarantee is restricted to Rs. _____ (Rs. _____ only). Our Guarantee shall remain in force until _____. TSREDCO shall be entitled to invoke this Guarantee till _____ [Insert date which is 30 days after the date in the preceding sentence].

The Guarantor Bank hereby agrees and acknowledges that the TSREDCO shall have a right to invoke this BANK GUARANTEE in part or in full, as it may deem fit.

The Guarantor Bank hereby expressly agrees that it shall not require any proof in addition to the written demand by TSREDCO, made in any format, raised at the above mentioned address of the Guarantor Bank, in order to make the said payment to TSREDCO.

The Guarantor Bank shall make payment hereunder on first demand without restriction or conditions and notwithstanding any objection by ----- [Insert name of the Bidder] and/or any other person. The Guarantor Bank shall not require TSREDCO to

justify the invocation of this BANK GUARANTEE, nor shall the Guarantor Bank have any recourse against TSREDCO in respect of any payment made hereunder.

This BANK GUARANTEE shall be interpreted in accordance with the laws of India and the courts at Delhi shall have exclusive jurisdiction.

The Guarantor Bank represents that this BANK GUARANTEE has been established in such form and with such content that it is fully enforceable in accordance with its terms as against the Guarantor Bank in the manner provided herein.

This BANK GUARANTEE shall not be affected in any manner by reason of merger, amalgamation, restructuring or any other change in the constitution of the Guarantor Bank.

This BANK GUARANTEE shall be a primary obligation of the Guarantor Bank and accordingly TSREDCO shall not be obliged before enforcing this BANK GUARANTEE to take any action in any court or arbitral proceedings against the Bidder, to make any claim against or any demand on the Bidder or to give any notice to the Bidder or to enforce any security held by TSREDCO or to exercise, levy or enforce any distress, diligence or other process against the Bidder.

Notwithstanding anything contained hereinabove, our liability under this Guarantee is restricted to Rs. _____ (Rs. _____ only) and it shall remain in force until _____ [*Date to be inserted on the basis condition of this Tender*] with an additional claim period of thirty (30) days thereafter. We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only if TSREDCO serves upon us a written claim or demand.

Signature _____

Name _____

Power of Attorney No. _____

For _____ [Insert Name of the Bank] _____ Banker's Stamp and Full Address.

Dated this ____ day of ____, 20__

POWER OF ATTORNEY

(To be on non-judicial stamp paper of appropriate value as per Stamp Act relevant to place of execution.)

(a) Power of Attorney to be provided by the Bidding Company in favour of its representative as evidence of authorized signatory's authority.

Know all men by these presents, We
(name and address of the registered office of the Bidding Company as applicable) do hereby constitute, appoint and authorize Mr./Ms. (name& residential address) who is presently employed with us and holding the position of as our true and lawful attorney, to do in our name and on our behalf, all such acts, deeds and things necessary in connection with or incidental to submission of our Bid for implementation of grid connected Roof top solar PV scheme in the State___ in response to the NIT No
dated issued by Telangana State Renewable Energy Development Corporation Ltd (TSREDCO), including signing and submission of the Bid and all other documents related to the Bid, including but not limited to undertakings, letters, certificates, acceptances, clarifications, guarantees or any other document which the TSREDCO may require us to submit. The aforesaid Attorney is further authorized for making representations to the TSREDCO and providing information / responses to TSREDCO representing us in all matters before TSREDCO, and generally dealing with TSREDCO in all matters in connection with Bid till the completion of the bidding process as per the terms of the above mentioned NIT.

We hereby agree to ratify all acts, deeds and things done by our said attorney pursuant to this Power of Attorney and that all acts, deeds and things done by our aforesaid attorney shall be binding on us and shall always be deemed to have been done by us.

All the terms used herein but not defined shall have the meaning ascribed to such terms under the NIT.

Signed by the within named

..... **(Insert the name of the executant company)**

through the hand of

Mr.

duly authorized by the Board to issue such Power of Attorney

Dated this day of

Accepted

.....

Signature of Attorney

(Name, designation and address of the Attorney)

Attested

.....

(Signature of the executant)

(Name, designation and address of the executant)

.....

Signature and stamp of Notary of the place of execution

**Common seal of has been affixed in my/our presence pursuant to
Board of Director's Resolution dated.....**

WITNESS

1.

(Signature)

Name.....

Designation

2.

(Signature)

Name.....

Designation

Notes:

The mode of execution of the power of attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executant(s) and the same should be under common seal of the executant affixed in accordance with the applicable procedure. Further, the person whose signatures are to be provided on the power of attorney shall be duly authorized by the executant(s) in this regard.

The person authorized under this Power of Attorney, in the case of the Bidding Company / Lead Member being a public company, or a private company which is a subsidiary of a public company, in terms of the Companies Act, 1956, with a paid up share capital of more than Rupees Five crores, should be the Managing Director / whole time director/manager appointed under section 269 of the Companies Act, 1956. In all other cases the person authorized should be a director duly authorized by a board resolution duly passed by the Company.

Also, wherever required, the executant(s) should submit for verification the extract of the chartered documents and documents such as a Board resolution / power of attorney, in favour of the person executing this power of attorney for delegation of power hereunder on behalf of the executant(s).

CONSORTIUM AGREEMENT

(To be on non-judicial stamp paper of appropriate value as per Stamp Act relevant to place of execution)

THIS Consortium Agreement (“Agreement”) executed on this _____ day of _____ 2018 between M/s [insert name of Lead Member] _____ a Firm / Company incorporated under the laws of _____ and having its Registered Office at _____ (hereinafter called the “Lead Member”, which expression shall include its successors, executors and permitted assigns)

and

M/s _____ a Firm / Company incorporated under the laws of _____ and having its Registered Office at _____ (hereinafter called the “Technical Member”, which expression shall include its successors, executors and permitted assigns), which expression shall include its successors, executors and permitted assigns)

WHEREAS, each Member individually shall be referred to as the “Member” and both the Members shall be collectively referred to as the “Members” in this Agreement.

WHEREAS the Telangana State Renewable Energy Development Corporation Ltd Limited(hereinafter called TSREDCO) , a Company incorporated under the Company’s Act, 1956 has invited response to Tender No. ____ dated ____ for design, manufacture, supply, erection, testing and commissioning including warranty, operation & maintenance of Roof Top Solar PV power system under RESCO MODE.

WHEREAS the Tender documents stipulate that the Lead Member may enter into a Technical Consortium Agreement with another Company / Corporate entity to fulfill the Technical Eligibility Criteria as stipulated in the Tender document. The Members of the Bidding Consortium will have to submit a legally enforceable Consortium Agreement in a format enclosed with the Tender document.

NOW THEREFORE, THIS AGREEMENT WITNESSTH AS UNDER:

In consideration of the above premises and agreements all the Members in this Consortium do hereby mutually agree as follows:

1. We, the Members of the Consortium and Members to the Agreement do hereby unequivocally agree that (M/s_____), shall act as the Lead Member as defined in the Tender for self and agent for and on behalf of Technical Member _____.
2. The Lead Member is hereby authorized by the Technical Member of the Consortium to bind the Consortium and receive instructions for and on their behalf.
3. The Lead Member shall be liable and responsible for ensuring the individual and collective commitment of each of the Members of the Consortium in discharging all of their respective obligations. Each Member further undertakes to be individually liable for the performance of its part of the obligations without in any way limiting the scope of collective liability envisaged in this Agreement.
4. Subject to the terms of this Agreement, the Technical member shall be responsible for providing technical knowledge for “Design, Manufacture, Supply, Erection, Testing and Commissioning including Warranty, Operation & Maintenance” to the lead member.
5. In case of any breach of any commitment by any of the Consortium Members, the Lead Member shall be liable for the consequences thereof.
6. This Agreement shall be construed and interpreted in accordance with the Laws of India and courts at Delhi alone shall have the exclusive jurisdiction in all matters relating thereto and arising there under.
7. It is hereby further agreed that in case of being shortlisted, the Members do hereby agree that they shall abide by the terms & conditions of the RFS document.
8. It is further expressly agreed that this Agreement shall be irrevocable and shall form an integral part of the Tender submitted to TSREDCO and shall remain valid till completion of the job assigned to the Contractor.
9. The Lead Member is authorized and shall be fully responsible for the accuracy and veracity of the representations and information submitted by the Members respectively from time to time in the response to Tender.
10. It is hereby expressly understood between the Members that no Member at any given point of time, may assign or delegate its rights, duties or obligations under this agreement without the explicit permission of TSREDCO.
11. This Agreement
 - (a) Has been duly executed and delivered on behalf of each Member hereto and constitutes the legal, valid, binding and enforceable obligation of each such Member;
 - (b) Sets forth the entire understanding of the Members hereto with respect to the subject matter hereof; and
 - (c) May not be amended or modified except in writing signed by each of the Members and with prior written consent of TSREDCO.

IN WITNESS WHEREOF, the Members have, through their authorised representatives, executed these present on the Day, Month and Year first mentioned above.

For M/s-----[Lead Member]

(signature, Name & Designation of the person authorized vide Board Resolution Dated [●])

Witnesses:

1) Signature-----

2) Signature -----

Name:

Name:

Address:

Address:

For M/s-----[Technical Member]

(signature, Name & Designation of the person authorized vide Board Resolution Dated [●])

Witnesses:

Following documents will be required to be submitted for project sanction:

1. Agreement between the bidder and the owner of the Project and Building/Roof top (Notarised original agreement on stamp paper of appropriate value should be enclosed).
2. All Agreement shall generally have reference to the TSREDCO's Tender No. and Letter of Allocation and provisions as per terms and conditions, technical specification and performance parameter in line with the TSREDCO's Tender Document against which Letter of Allocation has been issued. In addition, it shall indicate the price / tariff payable by the roof top Owner to the developer, payment terms, completion period along with other conditions of contract like insurance, warranty, force majeure, arbitration, jurisdiction, governing law, site access for the developer, and, site access for TSREDCO officials for the entire plant life, obligation of the roof top owner regarding providing of data to TSREDCO as per the RFS Document etc.
3. No Objection Certificate from the concerned DISCOM for grid connectivity or CEIG approval (In case CEIG approval is suffice for grid connectivity). Undertaking of Successful Bidder on stamp Paper for indemnification of TSREDCO shall be furnished in case approval of CEIG is only furnished for grid connectivity.

(Not mandatory during project identification, however mandatory for project commissioning/operation).

4. Summary Project Report as per Format at **Annexure**.

1. Periodic cleaning of solar modules, preferably once every fortnight.
2. O&M of Solar Power Plant shall be compliant with grid requirements to achieve committed energy generation.
3. Periodic checks of the Modules, PCUs and BoS shall be carried out as a part of routine preventive and breakdown maintenance.
4. Immediate replacement of defective Modules, Invertors/PCUs and other equipment as and when required.
5. Supply of all spares, consumables and fixtures as required. Such stock shall be maintained for all associated equipments and materials as per manufacturer/supplier's recommendations.
6. All the equipment testing instrument required for Testing, Commissioning and O&M for the healthy operation of the Plant shall be maintained by the Bidder. The testing equipments must be calibrated once every 2 years from NABL accredited labs and the certificate of calibration must be kept for reference as required.
7. If negligence/ mal-operation on part of the Bidder's operator results in failure of equipment, such equipment should be repaired/ replaced by the Bidder free of cost.
8. If any jobs covered in O&M Scope as per RFS are not carried out by the contractor/ Bidders during the O&M period, the Engineer-In-Charge shall take appropriate action as deemed fit.
9. TSREDCO reserves the right to make surprise checks/ inspection visits at its own or through authorized representative to verify the O&M activities being carried out by the Bidder. Failure to adhere to above guidelines will result in penal action including debarring from participation in next tender.

Quality Certification, Standards and Testing for Grid-connected Rooftop Solar PV Systems/Power Plants

Quality certification and standards for grid-connected rooftop solar PV systems are essential for the successful mass-scale implementation of this technology. It is also imperative to put in place an efficient and rigorous monitoring mechanism, adherence to these standards. Hence, all components of grid-connected rooftop solar PV system/ plant must conform to the relevant standards and certifications given below:

Solar PV Modules/Panels	
IEC 61215/ IS 14286	Design Qualification and Type Approval for Crystalline Silicon Terrestrial Photovoltaic (PV) Modules
IEC 61701	Salt Mist Corrosion Testing of Photovoltaic (PV) Modules
IEC 61853- Part 1/ IS 16170: Part 1	Photovoltaic (PV) module performance testing and energy rating –: Irradiance and temperature performance measurements, and power rating
IEC 62716	Photovoltaic (PV) Modules – Ammonia (NH ₃) Corrosion Testing (As per the site condition like dairies, toilets)
IEC 61730-1,2	Photovoltaic (PV) Module Safety Qualification – Part 1: Requirements for Construction, Part 2: Requirements for Testing
IEC 62804	Photovoltaic (PV) modules - Test methods for the detection of potential-induced degradation. IEC TS 62804-1: Part 1: Crystalline silicon (mandatory for applications where the system voltage is > 600 VDC and advisory for installations where the system voltage is < 600 VDC)
IEC 62759-1	Photovoltaic (PV) modules – Transportation testing, Part 1: Transportation and shipping of module package units
Solar PV Inverters	
IEC 62109-1, IEC 62109-2	Safety of power converters for use in photovoltaic power systems – Part 1: General requirements, and Safety of power converters
	for use in photovoltaic power systems Part 2: Particular requirements for inverters. Safety compliance (Protection degree IP 65 for outdoor mounting, IP

	54 for indoor mounting)
IEC/IS 61683 (as applicable)	Photovoltaic Systems – Power conditioners: Procedure for Measuring Efficiency (10%, 25%, 50%, 75% & 90-100% Loading Conditions)
BS EN 50530 (as applicable)	Overall efficiency of grid-connected photovoltaic inverters: This European Standard provides a procedure for the measurement of the accuracy of the maximum power point tracking (MPPT) of inverters, which are used in grid-connected photovoltaic systems. In that case the inverter energizes a low voltage grid of stable AC voltage and constant frequency. Both the static and dynamic MPPT efficiency is considered.
IEC 62116/ UL 1741/ IEEE 1547 (as applicable)	Utility-interconnected Photovoltaic Inverters - Test Procedure of Islanding Prevention Measures
IEC 60255-27	Measuring relays and protection equipment – Part 27: Product safety requirements
IEC 60068-2 (1, 2, 14, 27, 30 & 64)	Environmental Testing of PV System – Power Conditioners and Inverters a) IEC 60068-2-1: Environmental testing - Part 2-1: Tests - Test A: Cold b) IEC 60068-2-2: Environmental testing - Part 2-2: Tests - Test B: Dry heat c) IEC 60068-2-14: Environmental testing - Part 2-14: Tests - Test N: Change of temperature d) IEC 60068-2-27: Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock e) IEC 60068-2-30: Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle) f) IEC 60068-2-64: Environmental testing - Part 2-64: Tests - Test Fh: Vibration, broadband random and guidance
IEC 61000 – 2,3,5 (as applicable)	Electromagnetic Interference (EMI) and Electromagnetic Compatibility (EMC) testing of PV Inverters

Fuses

IS/IEC 60947 (Part 1, 2 & 3), EN 50521	General safety requirements for connectors, switches, circuit breakers (AC/DC): a) Low-voltage Switchgear and Control-gear, Part 1: General Rules b) Low-Voltage Switchgear and Control-gear, Part 2: Circuit Breakers c) Low-voltage switchgear and Control-gear, Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units d) EN 50521: Connectors for photovoltaic systems – Safety requirements and tests
IEC 60269-6	Low-voltage fuses - Part 6: Supplementary requirements for fuse-links for the protection of solar photovoltaic energy systems

Surge Arrestors

IEC 62305-4	Lightening Protection Standard
IEC 60364-5-53/IS 15086-5 (SPD)	Electrical installations of buildings - Part 5-53: Selection and erection of electrical equipment - Isolation, switching and control
IEC 61643-11:2011	Low-voltage surge protective devices - Part 11: Surge protective devices connected to low-voltage power systems - Requirements and test methods

Cables

IEC 60227/IS 694, IEC 60502/IS 1554 (Part 1 & 2)/ IEC69947	General test and measuring method for PVC (Polyvinyl chloride) insulated cables (for working voltages up to and including 1100 V, and UV resistant for outdoor installation)
BS EN 50618	Electric cables for photovoltaic systems (BT(DE/NOT)258), mainly for DC Cables

Earthing /Lightning

IEC 62561 Series (Chemical earthing)	IEC 62561-1 Lightning protection system components (LPSC) - Part 1: Requirements for connection components IEC 62561-2 Lightning protection system components (LPSC) - Part 2: Requirements for conductors and earth electrodes IEC 62561-7 Lightning protection system components (LPSC) - Part 7: Requirements for earthing enhancing compounds
Junction Boxes	
IEC 60529	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
Energy Meter	
IS 16444 or as specified by the DISCOMs	A.C. Static direct connected watt-hour Smart Meter Class 1 and 2 — Specification (with Import & Export/Net energy measurements)
Solar PV Roof Mounting Structure	
IS 2062/IS 4759	Material for the structure mounting

Note- Equivalent standards may be used for different system components of the plants. In case of clarification following person/agencies may be contacted.

Ministry of New and Renewable Energy (Govt. of India) National
Institute of Solar Energy
The Energy & Resources Institute TUV
Rheinland
UL

PROJECT REPORT FORMAT**Format for Summary Project Report for
Grid Connected Rooftop and Small SPV Power Plants**

1. Name of Bidder
2. Tender no.
3. Project details (Site location & Address)
4. Brief about the Rooftop Solar Power Generation System
5. Details of the beneficiary
6. Specifications of the Components and Bill of Material/ Quantities

Sl. no	Component	Specifications	Quantity	Make
A	Solar PV module			
A.1	Aggregate Solar PV capacity (kWp)			
B	Grid Tie inverter (Type and Capacity)			
B.1	Aggregate Inverter capacity (kVA)			
C	Module mounting structure (Certified by a Structural Engineer (Mandatory for 101 kWp to 1000 kWp)			
D	Array Junction Box			
E	AC Distribution Board			
F	Cable (All type)			
G	Earthing Kit (maintenance free)			
H	Meters			
I	Online monitoring system			
J	Any other component			
K	Transformer			

7. Unit cost of solar power generation
8. Cost benefit analysis, payback period
9. Expected output/annum.
10. Respective drawings for layout, electrical wiring connections, earthing, components etc.
11. Connectivity details with grid and metering arrangement (with sketch diagram)
12. Copy of electricity bill of the beneficiary and consumer number
13. Any other information
14. Documentary proof regarding beneficiary type

CHECK LIST**IMPORTANT:**

The Bidder must ensure that the following details in the check list are furnished along with the bid document. The bidder must also carefully go through all the contents of the BID Document and any additional information/documents, required more than the items listed in the check list below, also shall have to be furnished. Non-furnishing of any required information/document as per the Tender Document will lead to rejection of the bid. **(in the following order only).**

S.No	Particulars	Yes / No	Pg. No.	Name of the File uploaded
1	Tender Document Fee of Rs.29,500/- in the form of DD.			
2	EMD of Rs.2,00,000/- (DD/BG) drawn from any Nationalised/ Scheduled Bank			
3	Bidder Information Sheet			
4	Tender document, duly signed and stamped in token of accepted all the terms and conditions of the tender schedule.			
5	Registration Certificate (firm registration)			
6	Copy of PAN card & GST Certificate			
7	Original Manufacturer Certificate			
8	Registration with TSREDCO for FY 2018-19			
9	Certificate of the bidders turnover for the financial years 2015-16, 2016-17 and 2017-18 in rupees must be enclosed and be duly certified by firm of Chartered Accountant.			
10	Solar PV Module Efficiency has to be greater than 15% @STC. (proof to be submitted)			
11	ISO Certificate			
12	The bidder should have set up at least one roof top solar power plant of 200 kWp cumulative			
13	List of present clients with contact address & telephone numbers.			
14	Certificate to the effect the solar PV modules are indigenously manufactured in India			
15	Site visit certification			
16	Power of Attorney, wherever applicable			
17	Any other information/documents that are required in the bid document			
18	Detailed drawings as specified in the tender schedule			
19	Consortium agreement			

NOTE: All pages of the bid documents must be serially numbered and signed.