

Bid for Design, Engineering, Supply, Procurement, Installation, Commissioning, Operation and Maintenance of 224 MW solar Photovoltaic grid connected power plant ranging from 10 MW to 55 MW at various substations of GETCO of Surendranagar, Morbi Kutchh, Jamnagar & Surat Districts in the State of Gujarat”.

- a. The Covering Letter as per the format prescribed in Appendix 1: Format for Covering Letter.
 - b. Details of the Bidder as per format prescribed in Appendix 2: Details of Bidder. Attested copy of GST registration certificate of Bidder.
 - c. Attested copy of PAN Card for Bidder.
 - d. Attested Certificate of Commencement of Business issued by the Registrar of Companies for the Bidder.
 - e. Attested copy of Provident Fund Code of Bidder.
 - f. Details of similar technical experience of the Bidder as per format prescribed in Appendix 3: Format of Details of Similar Technical Experience.
 - g. List of proposed PV technologies as per format prescribed in Annexure 4: Format of Disclosure of PV Technology
 - h. Project execution plan as mentioned in Appendix 5: Format for Project Execution Plan.
 - i. Declaration of Compliance as per format prescribed in Appendix 9.
 - j. Declaration of Bidder’s relation to Directors of GSECL as per format prescribed in Tender
 - k. Details of qualified technical staff as per format prescribed in Appendix 8: Details of qualified technical staff.
 - l. No Deviation Certificate as per format prescribed in Appendix 10: No Deviation Certificate.
 - m. Format of Summary of audited financial statements as per format prescribed in Appendix 12: Format of Power of Attorney as Authorized Signatory.
 - n. (If applicable) Authorization of use of financial capability by Parent as per format prescribed in Appendix 14: Format of Authorization by Parent Company with the necessary financial statements and summary required from the Bidder.
 - o. Project Operation & Maintenance (O&M) Schedule with resource planning in the form of Gantt/ Pert Charts
 - p. Technical specifications and standard warranty document of PV modules.
 - q. Design, specifications and document of Solar Tracking solutions (if proposed by Bidder).
 - r. Specifications / Drawings / Designs and datasheets for all electrical work / components as prescribed in Clause No. 5
 - s. Technical specifications and warranty document of Inverters
 - t. Transformers, associated switchgear and others: Bidder shall furnish in detail its warranties/guarantees for these items.
- 4.4.3 Cover-III shall be duly marked as “copy of Proof of EMD and Tender Fee” and shall contain the copy of proof of Tender Fee and EMD.
- 4.4.4 Cover-IV shall be duly marked as “Financial Proposal unpriced duly signed and stamped” and shall contain the Financial Proposal (unpriced duly signed and stamped) as per the format prescribed in Appendix 15: Format of Financial Proposal.
- 4.4.5 All Bid documents shall be placed in hard binding and the pages shall be numbered serially. Each page thereof shall be initialled in blue ink by the authorized signatory.

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4.4.6 All envelopes in the Bid Documents shall be sealed. The outer envelope shall clearly bear the following identification:

4.4.7 Outer Envelope

4.4.8 “Tender Bid Document’ for Engineering, Procurement, Construction, and Operation and Maintenance of 224 MW Solar Photovoltaic Grid-Connected Power Plant using Photovoltaic Technology ranging from 10 MW to 55 MW at various substations of GETCO of Surendranagar, Morbi Kutchh, Jamnagar & Surat District in the State of Gujarat”.

4.4.9 Cover-I shall bear the following identification:

4.4.10 “Cover-I: Signed RFP Document for Engineering, Procurement, Construction, and Operation and Maintenance of 224 MW Solar Photovoltaic Grid-Connected Power Plant using Photovoltaic Technology ranging from 10 MW to 55 MW at various substations of GETCO of Surendranagar, Morbi Kutchh, Jamnagar & Surat District in the State of Gujarat”.

4.4.11 Cover -II shall bear the following identification:

4.4.12 “Cover-II: Enclosures of the “Bid of Design, Engineering, Supply, Procurement, Installation, Commissioning, Operation and Maintenance of 224 MW solar Photovoltaic grid connected power plant ranging from 10 MW to 55 MW at various substations of GETCO of Surendranagar, Morbi Kutchh, Jamnagar & Surat District in the State of Gujarat”.

4.4.13 Cover -III shall bear the following identification:

4.4.14 “Cover-III: EMD and Tender fees of the Bid of “Design, Engineering, Supply, Procurement, Installation, Commissioning, Operation and Maintenance of 224 MW solar Photovoltaic grid connected power plant ranging from 10 MW to 55 MW at various substations of GETCO of Surendranagar, Morbi Kutchh, Jamnagar & Surat District in the State of Gujarat”.

4.4.15 Cover -IV shall bear the following identification:

4.4.16 “Cover-IV: Financial Proposal (unpriced but duly signed and stamped) for the Bid of Design, Engineering, Supply, Procurement, Installation, Commissioning, Operation and Maintenance of 224 MW solar Photovoltaic grid connected power plant ranging from 10 MW to 55 MW at various substations of GETCO of Surendranagar, Morbi Kutchh, Jamnagar & Surat District in the State of Gujarat”.

4.4.17 Each of the envelopes shall clearly indicate the name and address of the Bidder. In addition, the Bid Due Date should be indicated on the right hand top corner of each envelope.

4.4.18 Each of the envelopes shall be addressed to:

ATTN:

The Chief Engineer (P&P)

Gujarat State Electricity Corporation Limited (GSECL)
Vidyut Bhavan, Race Course,
Vadodara-390 007, Gujarat
Tel.No.: +91 265 6612131, Fax No.: +91 265 2341588
Email:cepnp.gsecl@gebmail.com

4.4.19 If the envelopes are not sealed and marked as instructed above, the Company assumes no responsibility for the misplacement or premature opening of the contents of the Bid submitted.

4.4.20 Bids submitted by fax, telex, telegram, courier or e-mail shall not be entertained and shall be rejected.

4.5 Bid Due Date

4.5.1 Bids should be submitted before the Deadline for Submission of Bid as specified in NIT.

4.5.2 GSECL may, in its sole discretion, extend the Bid due date by issuing an Amendment/Addendum in accordance with Clause No. 3.6 uniformly for all Bidders.

4.6 Late Bids

4.6.1 Bids received by the Company after the specified time on the bid due date shall not be eligible for consideration and shall be summarily rejected. In case of the unscheduled holiday being declared on the prescribed closing/opening day of the Bid, the next working day shall be treated as the scheduled prescribed day of closing/opening of the Bid.

4.7 Confidentiality

4.7.1 Information relating to the examination, clarification, evaluation and recommendation for the Bidders shall not be disclosed to any person who is not officially concerned with the process or is not a retained professional advisor advising the Company in relation to or matters arising out of, or concerning the bidding process. The Company will treat all information, submitted as part of the Bid, in confidence and will require all those who have access to such material to treat the same in confidence. The Company may not divulge any such information unless it is directed to do so by any statutory entity that has the power under law to require its disclosure or is to enforce or assert any right or privilege of the statutory entity and/ or the Company.

4.8 Correspondence with the Bidder

4.8.1 The Company shall not entertain any correspondence with any Bidder in relation to acceptance or rejection of any Bid.

4.9 Bid Opening and Evaluation

4.9.1 The Company shall open, examine and evaluate the Bids in accordance with the provisions set out in this RFP document.

4.9.2 To facilitate evaluation of Bids, the Company may, at its sole discretion, seek clarifications in writing from any Bidder regarding its Bid.

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- 4.9.3 After the receipt of Bids the Company may at its discretion send a team of engineers if necessary to inspect the engineering facilities, to ensure suitability and satisfactory working conditions at the Bidder’s works/yards(s) and equipment listed to be used by the Bidder for the work. The Bidder shall ensure that the aforesaid team shall at all the times have access to visit and inspect works, equipment etc.
- 4.9.4 This tender is single Stage Two envelope bidding. Price bid shall be submitted at the time of submission of tender bid. Price Bid is required to be submitted online onN procure portal only.
- 4.9.5 GSECL will hold separate E Reverse auction for each Group separately. Bidders who are bidding for more than one Group will have to submit the separate price bids of those Groups.

4.10 Tests of Responsiveness

- 4.10.1 Prior to evaluation of Bids, the Company shall determine whether each Bid is responsive to the requirements of the RFP. A Bid shall be considered responsive only if:
- i. The minimum Performance Guaranteed of the Power Plant for one year is provided by the Bidder.
 - ii. it is received in the manner prescribed in this RFP
 - iii. it is accompanied by the requisite Tender Fee and EMD;
 - iv. it is received with all the Enclosures of the Bid as prescribed in the Clause 4.4
 - v. its Enclosures are received as per the formats specified in Appendices as well as the Tender;
 - vi. it contains all the information (complete in all respects) as requested in this Tender (in the same formats as specified);
 - vii. it complies will all the terms, conditions and provisions specified in this Tender; and
 - viii. it does not contain any conditions or deviations

4.10.2 The Company reserves the right to reject any Bid which is non-responsive and no request for alteration, modification, substitution or withdrawal shall be entertained by the Company in respect of such Bid.

4.11 Modification and Withdrawal of Bids

- 4.11.1 In case any clarifications are sought by the Company after opening of Bids then the replies of the Bidder should be restricted to the clarifications sought. Any Bidder who modifies its Bid (including a modification which has the effect of altering the value of its Financial Proposal) after opening of Bid without specific reference by the Company, shall render the Bid liable to be rejected without notice and without further reference to the Bidder and its EMD shall be forfeited.
- 4.11.2 No Bid may be withdrawn in the interval between the bid due date and the expiration of the validity period of the Bid. Withdrawal or unsolicited modification of a Bid during this interval shall result in the Bidder's forfeiture of its Bid Security.

4.12 Evaluation of Bid and selection of Bidder

- 4.12.1 GSECL will examine the Bid to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed, and whether the Bid is generally in order.
- 4.12.2 Prior to the detailed evaluation, GSECL will determine the substantial responsiveness of each Bid. A substantially responsive Bid is one which conforms to all the terms and conditions of the Tender Documents without material deviations. Deviations from or objections or reservations to critical provisions such as those concerning EMD, Applicable Law and Taxes and Duties will be deemed to be a material deviation. GSECL’s determination of a Bid’s responsiveness is to be based on the contents of the Bid itself without recourse to extrinsic evidence.
- 4.12.3 If the Bid is not substantially responsive, it will be rejected by GSECL and may not subsequently be made responsive by the Bidder by correction of the nonconformity.
- 4.12.4 GSECL will evaluate and compare Bids which have been determined to be substantially responsive.
- 4.12.5 A Bidder shall have to quote for at least for one Group in line with name plate capacity of that Group of Solar PV power project.
- 4.12.6 Following factors shall be required for evaluation of Bid:
- a. The Evaluated Bid Value (EBV) shall be calculated using the following parameters:
 - i. Engineering Procurement Commissioning (EPC) Contract Price;
 - ii. Net Present Value (NPV) of O&M Price of Five (5) years;
 - iii. Net Electrical Energy Generation Guarantee; and
 - iv. Constant parameters as indicated in the Tender if any.
 - b. The Bid with the Lowest Evaluated Bid Value shall be considered as L-1 and the Successful Bidder. The Bid with next highest value shall be considered as L-2 and so on for more understanding please refer Appendix 6. An example has also been done for Bidder’s comprehension.
- 4.12.7 In no case, a Bidder shall have the right to claim to be the Successful Bidder for its Bid.
- 4.12.8 Evaluation of both Techno-Commercial (un-priced) bids and priced bids shall be done separately.
- 4.12.9 Price Bids of only techno-commercial acceptable bids shall be considered for further evaluation.
- 4.12.10 **Lowest six (6) eligible bidders or 50% out of total eligible Bidders** (rounded to the next higher whole number), whichever is higher, shall be invited for participation in e-Reverse Auction.

The terms and conditions and Guideline for e-Reverse Auction shall be as per attached Annexure.

- 4.12.11 The reduction offered by the Bidder during e-Reverse Auction Process on the EBV shall be considered for as an equivalent reduction in Total EPC Contract Price only, based on formula of EBV indicated in Appendix-6. Accordingly, final EPC Contract Price will be arrived for all contractual purposes based Quoted O&M cost for 5 years and NEEGG for 5 years shall remain fixed and no change will be allowed in these parameters during e-Reverse Auction.
- 4.12.12 After e-Reverse Auction process, L1 bidder for the Group shall be decided on lowest EBV. The L1 bidder after e-Reverse Auction shall have to submit break-up in line with their quoted price bid within three (3) **working** days.
- 4.12.13 Bidder's Has to submit Location wise Price Break up After E-RA. The reduction of Price break up shall reflect reduction of basic price of items. The successful bidder is required to submit location wise NEEGG after E-RA. The Lower limit for CUF of all individual locations is also 25 % (AC).
- 4.12.14 O&M period will be 5 years after COD with GEDA / GUVNL& completion of all works as per RFP, whichever is later.

4.13 Contacts during Bid Evaluation

- 4.13.1 Bids shall be deemed to be under consideration immediately after they are opened and until such time the Company makes official intimation of award/ rejection to the Bidders. While the Bids are under consideration, Bidders and/ or their representatives or other interested parties are advised to refrain from contacting by any means, the Company and/ or their employees/ representatives on matters related to the Bids under consideration.

4.14 Employment of Officials/ Ex-Official of the Company

- 4.14.1 Bidders are advised not to employ serving the Company. It is also advised not to employ ex-personnel of the Company within the initial two years period after their retirement/ resignation/severance from the service without specific permission of the Company. The Company may decide not to deal with such firms who fail to comply with the above advice.

4.15 Declaration on Bidder's Relation to Directors

- 4.15.1 The Bidders are required to certify in prescribed format Appendix 9: Declaration of Compliance, whether he/they is/are related to any of the Directors/Senior Personnel of the Company in any of the ways mentioned in the Certificate. It is clarified that any such affirmative certificate shall not, by itself, prejudice consideration of the Bid. This certificate must accompany the Bid.

4.16 Letter of Intent (“LOI”) and Notification to Proceed

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4.16.1 After selection of the Successful Bidder, a Letter of Intent (the “LoI”) shall be issued, in duplicate, to the Successful Bidder. The Successful Bidder shall not be entitled to seek any deviation from the Contract, as may have been amended by GSECL prior to the bid submission date.

4.16.2 On issue of the LoI by the Company, Authorised representative of the Successful Bidder shall sign the Contract Agreement within 7 (seven) days and submit the Bank Guarantee within the stipulated time.

4.16.3 GSECL will issue Notice to Proceed separately for each project unless it is mentioned in LOI. Time line of the project shall be from Notice to Proceed.

4.17 Performance Guarantee

4.17.1 Please refer clause no3.11.6(i)

4.17.2 The bank guarantee by the Contractor will be given from bank specified in Appendix 17: List of Banks (for Bank Guarantee) only. BG of any other Bank will not be treated as valid BG.

4.18 Fraudulent Practices

4.18.1 The Bidders may please note that the Company shall not entertain any correspondence or queries on the status of the Bids received against this RFP. Bidders are advised not to depute any of their personnel or agents to visit the Company’s office for making such inquiries.

4.18.2 Any effort by a Bidder to influence the Company on the Bid evaluation, Bid comparison or Contract award decision may result in the rejection of the Bidder's Bid.

--- End of Section ---

5 Scope of Work

5.1 GENERAL SCOPE OF WORK

The Tender is invited for setting up of grid connected solar PV power plants ranging from 10 MW to 55 MW at government waste land around substations of GETCO in the Gujarat. The cumulative maximum DC installation capacity under Standard Test Conditions (STC) as per IEC61215 and IEC:61730.

The Contractor shall comply that the maximum AC capacity shall not exceed 5% higher than the capacity mentioned for respective substation.

The general scope of work involves Design, Engineering, Procurement & Supply and Construction (EPC) of the grid-connected solar photovoltaic power plant commissioning and evacuation of power into the GETCO’s 66 kV substation through construction, erection, testing and commissioning of complete 66 KV bay along with bus bar extension in respective 66KV substations at GETCO, as per GETCO guidelines, is in bidder's scope. Refer Annexure -7.with the guaranteed plant performance in the form of guaranteed energy output. Generation from solar PV plant shall be terminated 66 KV GETCO S/s., through 66 KV U/g cable or **single circuit** overhead line, which must be GETCO approved Cable or AL conductor of suitable rating as per current carrying capacity, fault level and voltage drop selection criteria.

The project site location are as under:

Group no. & District	Locations	Land area in (Ha)	Co-Ordinate of locations	Capacity of location in(MW)	Respective GETCO S/s	Capacity of Group in (MW)
Group 1 Dist.:Surendranagar	Sayla	87.00	Latitude: 22.52 °N Longitude: 71.47 °E	42	400 KV Shapar SS- SS distance- @ 18-20 Km	42
Group 2 Dist.:Surendranagar	Sitagadh	44.92	Latitude: 22.53 °N Longitude: 71.28 °E	15	400 KV Shapar SS- SS distance- @ 7-8 Km	27

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	Kuntalpur	51.84	Latitude: 22.76 °N Longitude: 71.33 °E	12	220 KV Sadla SS. SS distance- @ 3-4 Km	
Group 3 Dist.:Mor bi	Hasanpar	26.58	Latitude :22.637017 Longitude :70.975175	13	66 KV Bhojapara	38
	Vitthalpar	32.66	Latitude: 22.693663 Longitude: 70.992936	15	66 KV Lakadhar_II	
	Khanpar	26.71	Latitude :22.675020 Longitude :71.073500	10	66 KV Lunsar SS.	
Group 4 Dist.: Morbi	Lunsar	111.94	Latitude : 22.696887 Longitude : 71.077654	30	66 KV Rajgadh SS distance- @ 2 Km	51
	Jambudiya Vidi	32.13	Latitude: 22.746580 Longitude: 71.097553	11	66 KV Chupani. SS distance- @ 7 Km	
	Garida	27.80	Latitude: 22.49 °N Longitude: 71.30 °E	10	66 KV Mahika SS. SS distance-	

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					@ 2-3 Km	
Group 5 Dist: Kutchh	Junachay	157.83	Latitude: 23.6281 Longitude: 69.0069	30	66KV Junachay	40
	Manjal	35.45	Latitude: 23.2282 Longitude: 69.4039	10	66KV Khirasara	
Group 6 Dist: Jamnagar	Nikava	25.05	Latitude: 22.20° N Longitude: 70.55° E	10	66 KV Nikava	10
Group 7 Dist: Surat	Mora	36.42	Latitude: 21.17 °N Longitude: 72.65 °E	16	66 KV Mora	16

5.1.1

Note: The Land allotment Orders to GSECL and Mapni Sheet from respective collector is attached with tender. Bidder has to adhere all the conditions of land order and Mapni Sheet for establishment of solar projects.

5.1.2 Evacuation of Power & Metering Point:

For the purpose of this project, the evacuation voltage shall be at 66 KV AC (three phase) wherein evacuating point cum metering point shall be installed at at 66 KV GETCO Substation for ABT metering. Scope of work shall also include 66 KV Under Ground cable work from solar plant to GETCO 66 KV substation as well as construction, erection, testing and commissioning of complete 66 KV bay along with bus bar extension in respective substations as per GETCO guidelines. ABT Meter to measure net power evacuation shall be installed at 66 KV GETCO and SPV Plant end as per GETCO guidelines. For each solar PV plant, 4 cables (three-phase plus one spare) are required. ROW and all relevant approvals from statutory authority are in bidder's scope.

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(a)“Bidder is required to submit the Test reports supported by self-undertaking as well as compliance certificate from manufacturer for all applicable provisions under the CEA (Technical standards for connectivity to the Grid) Regulations, 2007 (as amended) ((including the provisions of LVRT/HVRT, active power injection control, dynamically varying reactive power support, limits for harmonic & DC injection, Flicker limits, etc.) from labs accredited by Govt./NABL/other recognized agencies. In case any discrepancies / incompleteness are found in the documents / test reports submitted, the connectivity agreement shall not be processed further. Also, SLDC requirements (<https://sldcguj.com/compdoc/SLDC%20STATUTARY%20REQUIREMENT%20WIND%20SOLAR%20DOCUMENT.pdf>)needs to be fulfilled before actual connectivity established with the grid.”

(b) 66 KV voltage profile at all these substation are being maintained in a way that adequate voltage profile is available at subsequent 66KV substations as well as 11 KV feeders at respective substations. Therefore, all the solar projects are required to be tuned according to operating voltage profile at respective substations.

Operation and Maintenance (O&M):

Comprehensive operation & Maintenance of the Solar PV plant including supply of spare parts, consumables, repairs/replacement of any defective equipment etc. shall be performed by the contractor for a period of 05 years. Five years O & M is compulsory and other five years may be extendable for further period on mutually agreeable basis.

The scope of work includes Operation and Maintenance (O&M) of the plant for Five (5) years, where in the plant shall generate at least equivalent to the guaranteed Performance of the plant. The Bidder shall submit in the Bid a comprehensive project execution schedule as well as Operation and Maintenance (O&M) schedule with resource planning in the form of Gantt chart, Bar chart, PERT chart and shall be liable for abiding by the schedule. It is the responsibility of the Contractor to perform the necessary maintenance/ timely replacement of all Civil /Mechanical or Electrical components of the project during this O&M period such that the guaranteed performance of the plant is not compromised. Any damage to CIVIL/ ELECTRICAL/ MECHANICAL components of the plant is to be reworked/ replaced/ supplied without any extra cost and time by the Contractor during complete O&M period. The Operation and Maintenance shall be comprehensive. The maintenance service provided shall ensure project functioning of the Solar PV system as a whole and Power Evacuation System to the extent covered in the Contract. All preventive/ routine maintenance and breakdown/ corrective maintenance required for ensuring maximum uptime shall have to be

provided. Accordingly, the Comprehensive Operation and Maintenance shall have two distinct components as described below:

- a. Preventive / Routine Maintenance: This shall be done by the Contractor regularly and shall include activities such as cleaning and checking the health of the Plant, cleaning of module surface, tightening of all electrical connections, and any other activity that may be required for proper functioning of the Plant as a whole. Necessary maintenance activities, preventive and routine for Transformers and associated switchgears also shall be included.
- b. Breakdown/ Corrective Maintenance: Whenever a fault has occurred, the Contractor has to rectify the fault, the fault must be rectified within 48 hrs time from the time of occurrence of fault, failing which the Contractor will be penalized as per terms and conditions of this Tender.

The date of Comprehensive Operation and Maintenance Contract period of the Plant shall begin on the date as defined in the NIT of this Tender. Detailed scope of comprehensive Operation & Maintenance has been described in Chapter 5 and Annexure 6 of this document. However, operation of the Power Plant means operation of system as per bidding schedule and workmanship in order to keep the project trouble free covering the guarantee period.

- c. Scheduling and forecasting activity/appointment of Qualified coordinating agency for scheduling and forecasting activity shall be in bidder’s scope. All required SCADA/System for each site shall be in bidder’s scope.

5.1.3 Tracking Structures:

The Company encourages Bidders to employ proven and reliable seasonal tracking system, however the Bidder should note that total land available is approximately as mentioned above in for the Project. The Bidder shall submit in the Bid, the details / specifications / designs / guarantees and warranties / and any other claims on performance / output of the solar tracking solutions in the Bid document. **Bidder may consider fixed or tilt or tracking system. Engineering is in the scope of Bidder.**

5.1.4 Electrical Work:

Consisting of installation of solar PV modules, junction boxes, grid-tied inverters, isolation transformers, meters, relay & control panel, 11 or 33 KV switchgear, 66 KV switchyard for evacuation at solar plant peripheri , 66 KV UG cable/transmission line , 66 KV bay and bus bar extension in GETCO substation ,interconnection through wires, cables, bus bars, **system**

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fault level study etc.; plant lighting system, automatic weather station, SCADA and remote web-based communication & monitoring hardware, software etc.; plant and human safety and protection equipment including danger signs etc. Anything not mentioned in the list but still required to finish the EPC contract of Solar Plant capacity to be considered for the BID and same is in the scope of bidder.

5.1.5 Civil and Other Non-Electrical Work:

Module Mounting Structures (MMS): The Contractor shall design, fabricate, supply and install module mounting structures with all required accessories like clamps, nuts, bolts, cable ties etc., The structures can be of fixed/ seasonal tracker are accepted.

Modules shall be mounted on a non-corrosive support structures (EPDM rubber gasket /Stainless Steel Star Washer). The frames and leg assemblies of the array structures shall be made of hot dip Galvanized steel per ASTM A123. All nuts and bolts (fasteners) shall be made very good quality stainless steel of grade SS 304 required for module fixing and for other components of MMS, superstructure or switchyard, inverter room, control room, etc. in the plant premises nuts and bolts (fasteners) shall be of MS material with minimum Grade HDG: 5.6.

Foundations: The Contractor shall design and construct appropriate civil foundations for MMS, prefabricated structures/RCC, transformers, switchyard equipment, feeder bay etc.

Prefabricated Structures: The following prefabricated /RCC structures are to be planned and constructed by the Contractor for the Solar PV project:

- Prefabricated Inverter rooms **for indoor inverters. All outdoor items shall be IP 65 or IP-54/IP55 with roof structure shall be required.**
- Prefabricated Watchman’s cabin (At Main Gate) - 01 Nos.
- Security : **Security cabin shall be provided at the entry of each pocket (i.e. if utilized for installing Solar PV Project) of project site.**

Storm Water Drainage System: The Contractor shall provide storm water drainage system for entire plant.

Solar PV Module Cleaning System: Cleaning frequency shall be decided by the Bidder to meet the guaranteed generation. For this, the Contractor shall construct and operate 10,000 litre /MW capacity RCC/Sintex or underground water storage tank. The Contractor also has to drill a bore and construct pipeline for carrying water to storage tank, provide electric panel and pump for bore and total water cleaning system. For module cleaning, the contractor can

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provide new tanker with pump; water jet and hose pipe or establish a pipeline network with valves. **Bidder may also consider Robotic/dry/ tractor mounted jet cleaning.**

RCC Precast Boundary Wall: The Contractor shall provide RCC precast boundary wall for the entire plant boundary of solar plant site. (as per drawing attached herewith).

Approach / Internal Roads and Pathways: The Contractor shall provide internal roads and approach roads / pathways of WBM type. If plant is being installed in more than one pockets. Each pocket shall have internal connectivity by WBM road. Peripheral roads & road connected to inverter transformer shall be of WBM. Carriage way Width of WBM/ Asphalt shall be 4 mtr. and Shoulders width of 0.50 mtr. On both side of road.

Cable Trenches: Construction of RCC cable trenches with cable trays and covers for inverter and control rooms, earthen excavated cable trench with alternate layers of sand and brick as per relevant IS from PV arrays to inverter room to control room to switchyard shall be provided by the Contractor. **However, during detail engineering cable laying philosophy will be decided and bidder shall have to follow respective philosophy as per standard.**

Main Gate: The Contractor shall provide main gate of structural steel material of appropriate design. Also, necessary arrangement has to be made by Contractor to erect the main gate on pylon stone.

5.1.5 Site levelling: The Contractor shall level the site, as required, so as to compact the plant in minimum possible area and also minimize shading losses because of solar PV module structures. Removal of debris and bush-cutting is mandatory. Levelling of the site is to be done if required. **Bidder shall design Array of Solar PV as per the natural contour of site. However, water accumulation (rain +plant) shall not be occurred in Solar PV plant area.**

5.1.6 Communication: The Contractor shall provide complete plant SCADA (Software based) with SCADA server having **string level** monitoring capabilities over remote server. Contractor shall lay the cable in appropriate cable trench, connect with suitable connectors and terminate to the SCADA server inside control room. The Contractor shall also provide necessary internet connection through GPRS enabled modem along with LAN connectivity for data communication over remote server and shall bear the cost of the same during the Contract period including O&M. The Contractor shall provide 3 nos. of Web Client License for remote monitoring per plot. The Contractor shall provide necessary provision of RTU for communication with SLDC. The Contractor shall submit the below mentioned Technical Data Sheet for String RTU, TCP String, Central RTU in the prescribed format. The necessary hardware and software required for SLDC communication from the plant as well as up to evacuation point shall be in the bidder’s scope. It is the responsibility of the contractor to obtain ALDC and SLDC connectivity .Necessary charges if any regarding SLDC connectivity shall be in the bidder’s scope.

Type Code

Power Entry Characteristics

AC input voltage range ($V_{ac, min}$ $V_{ac, max}$)

Nominal AC input voltage ($V_{ac, n}$)

Rated frequency (f_r)

DC Input Voltage Range ($V_{dc, min}$ $V_{dc, max}$)

Nominal DC input voltage ($V_{dc, n}$)

RS485 Section

Serial interface type

Baud rate

Protocol

Number of devices

Line biasing resistor (wherever necessary)

Termination resistor

RS485 MODBUS section

Serial interface type

Baud rate

Protocol

Number of devices

Line biasing resistor (wherever necessary)

Termination resistor

Physical and Environmental

Environmental protection rating

Ambien temperature range

Relative humidity

Compliance

Isolation

Marking

Safety and EMC standard

Essential list of I/O and equipment is given herewith, but scope is not limited to the Essential List, contractor is fully responsible to provide complete SCADA System which can be extensible / communicable with additional / future solar plant. 20 % spare I/O modules and equipments shall be provided.

Sr.	Equipment to be monitored	Data to Be Monitor (Real Time)	Type of IO
1	String Monitoring / Array Monitoring	String/Inverter level monitoring required	Through Communication with SJB PLC/Card
2	String Junction Box / Array Junction Box (SJB = AJB)	SJB internal temperature and SJB Bus Voltage and Current	Through Communication with SJB PLC/Card
3	Inverter	All Electrical Parameters of Inverter along with Scanning, Records & Error communication	Through Communication with SJB PLC/Card
4	Inverter Transformer	Oil and Winding Temp Monitoring	Analog Input
5	11/33 KV / VCB	ON/OFF and Trip position of VCB and Energy Meter RS-485 communication	DI and Communication
6	66KV Switchyard	All Equipment details including Power Transformer, Breakers, C&R Panels, Isolators, Earth Break Switches, Metering & Protection Devices etc.	DI and Communication

Bid for Design, Engineering, Supply, Procurement, Installation, Commissioning, Operation and Maintenance of 224 MW solar Photovoltaic grid connected power plant ranging from 10 MW to 55 MW at various substations of GETCO of Surendranagar, Morbi Kutchh, Jamnagar & Surat Districts in the State of Gujarat”.

7	Weather Monitoring Station	Two no. of Class I Pyranometer (one for GHI, one at PV plane collector angle), Two numbers of contact type temperature sensors at backside of the module. Ambient temperature sensor, Wind velocity and speed sensor.	Through Communication
8	Aux. Equipment's	Aux. Transformers, UPS, Fire Alarm Panel, Water & Utility Pumps & Panels,	AI / DI / Communication for Information / Records / Logging
9	Main and Check Meter	All electrical parameters recorded by energy meter	Through RS-485/MODDBUS communication

5.1.7 Plant Safety Equipments:

The Contractor shall provide appropriate numbers of foam type fire extinguishers / CO₂ extinguishers, sand buckets and transformer discharge rod at Invertor Rooms, Control Room, Security Cabin and Switchyard/Substation. Further, all high voltage places to be provided with danger sign boards with appropriate size and material to last for 25 years. Transformers shall be provided with appropriate Fire protection/ NIFPS fire prevention system.

5.1.8 Statutory Requirements:

All construction, operation and maintenance procedures shall be carried out as stipulated to appropriate relevant standards, regulations laid by CEA/GETCO / DISCOM / GEDA / GSECL / GoI / MNRE and / or any other agency as and when applicable. Further, this shall comply with the applicable labor laws. The Bidder shall make himself aware of such requirements and shall not solely depend on the Company to make available full information.

Bidders should follow GETCO norms, regulations, T & C, specifications and guidelines prevailing at present & amended time to time in all 66 KV and GETCO connected/related works. The GETCO norms, regulations, T & C, specifications and guidelines etc is available at GETCO site or will be provided at the time of LoI or as per requirement during the execution of the projects which is to be implemented in supply erection & commissioning and testing of GETCO items/related works. Following drawing/documents are attached for ready reference only.

- 1) Standard primary drawings for 66 KV GETCO substation (i.e. SLD, layout plan and section) – Attached as Annexure A6
- 2) Typical arrangement for GSECL solar feeder in 66KV s/s. (Attached as Annexure A7)
- 3) CEA regulation related to solar developers.(Attached as Annexure A8)
- 4) SCADA data/system requirement of GETCO with typical system architecture- Amendment(Attached as Annexure A9)
- 5) Solar SCADA shall be monitoring the equipment till 66KV Switchyard at Solar end of SPV project scope.

5.1.9 Planning and Designing:

- i. The Contractor shall plan and design for the electrical / mechanical / civil requirements including but not limited to plant configuration, space optimization, distance between rows of modules, sufficient passage for vehicle and man-power movement in the plant, mounting structures, location of inverter room, cable routing, selection of equipment and items, procurement plan etc. to enhance plant output.
- ii. The Contractor has to carry out the complete soil investigation of the site, through Government approved laboratory before designing various civil structures. The design of all civil foundations, R.C.C structures, buildings etc. shall be carried out considering appropriate seismic zone of the area. All appropriate loads, wind velocity, seismic factors etc. shall be considered as per the relevant IS Specifications while designing any civil structure. Also, the environmental conditions, soil characteristics, atmospheric effect, ground water table level, rain water data, land profile, etc. must be considered as per site actual condition and accordingly appropriate precautions and preventive measures shall be taken while designing the structures. RCC structures shall be adopted considering surrounding weather and soil conditions of site and as per the relevant IS codes. The concrete mix design test shall be carried out in Govt. certified laboratory or NABL Accredited laboratory for minimum M20 grade with 400 kilograms of cement.
- iii. The Contractor shall take into consideration all parameters like wind speed, seismic zone, safety factor and safe Soil Bearing Capacity (SBC) etc. for the purpose of design and construction of civil foundations for all civil work as per relevant IS codes.
- iv. The Contractor shall carryout Shadow Analysis at the site and accordingly design strings and arrays layout considering optimal usage of space, material and labor.
- v. All designs & drawings have to be developed based on the governing standards and requirements of the project and also keeping in mind basic design specifications.

Company may approve minor deviations or suggest required modifications in the same which are meant for increasing plant performance without sacrificing quality / workmanship norms.

- vi. All designs, specifications, reports, etc. submitted or used by the Contractor at any point in time shall first be approved by the Company /Consultant and revised by Company /Consultant, if required, prior to execution.
- vii. The technology offered shall be commercially established technology and at least one Project based on this technology shall be satisfactorily operational for at least one year in India. Details of the Project with location and the successful operational period of the Project utilizing this technology shall also be mentioned before the submission of first set of drawings for approvals.
- viii. The Contractor shall have to arrange the facility for testing bulk material at site such as elcometer for testing the galvanization, cube-testing machine for testing the strength of cube samples etc.
- ix. The Contractor shall have to send samples for testing of the material to Govt. accredited / NABL Accredited laboratory as when required by the Company.

5.1.10 Approval of Design/Drawings

The following procedure has to be followed for assessment and approval of designs, specifications and drawings during the course of the project: The Contractor shall submit to the Company/Consultant the documents in hard copy and soft copy both with proper reference and drawing numbers. The respective documents for selection, supply, installation, erection, commissioning of equipment/ structures have to be submitted at least 15 days in advance to the planned start of the activity as per the Contractor’s project schedule. The Contractor shall submit documents as required for this project according to his design and specifications. The Company / Consultant (on behalf of the Company) will assess, review and approve the documents within 15 days of submission of documents; and only after the approval the Contractor shall release the documents on site for execution. The documents shall be revised by the Contractor as per instructions /comments given by the Company / Consultant (on behalf of the Company) if required, prior to execution. Subsequent revisions and the final version of the documents shall also be submitted in hard and soft copy to the Company and the Consultant. The Contractor has to take into account the above mentioned process of revisions (if required) and adjust the preparation and delivery of the documents such that the overall planned project schedule is not affected.

- ii. The Contractor has to submit all drawings, which are related to plant for approval and the Contractor, shall not claim any drawing as their intellectual property. Drawing which is developed for project will be the intellectual property of the Company.
- iii. The Contractor shall submit a comprehensive project management schedule in the form of a Gantt chart CPM/PERT chart and shall be liable for abiding by the

schedule. **The submitted copy shall be compatible to open in either MS project or Primavera & MS Excel.**

- iv. The Contractor shall submit a comprehensive maintenance schedule for operation and maintenance of the photovoltaic power plant along with checklists before commencement of work on site and shall be liable for abiding by the schedule. All construction, operation and maintenance procedures shall be carried out through appropriate relevant standards, regulations and labor laws.

5.1.11 Final Commissioning

The commissioning procedure shall be as per GEDA/ GETCO / GSECL / DISCOM / Chief Electrical Inspector to Government (CEIG) requirements. The Contractor shall also ensure the following:

- i. Obtaining written certificate of commissioning of the facility and permission to connect to the grid from the office of the Chief Electrical Inspector of the state and any other authorized representative from Government of India (GoI) / GoG / GETCO / GSECL / DISCOM/GEDA.
- ii. Inspection and successful electrical commissioning certificate from the Company.
- iii. Obtaining all certificates required by DisCom from agency appointed by them.
- iv. Satisfactory completion certificate towards completion of all other contractual obligations by the Contractor as stipulated from the Company.

5.1.12 Comprehensive Operation and Maintenance Contract

The Bidder shall separately quote in Appendix 15.3 for Operation and Maintenance of the power plant for Five (05) Years where in the plant should perform at a minimum annual NEEGG derated every year by not more than 1% referring to the installed DC capacity of the plant indicated by the Bidder. Any damage to CIVIL/ELECTRICAL/MECHANICAL components of the plant is to be reworked/replaced/supplied without any extra cost and time by the Contractor during maintenance period. This means after completion of O & M period every component of the plant should be in good and working condition.

Disclaimer: Any civil / electrical / other work, which is not mentioned or included in this Tender document but necessary for the construction and O&M of Solar PV plant around GETCO substations shall be borne by the Contractor. The Contractor shall, unless specifically excluded in the Contract, perform all such works and /or supply all such items and materials not specifically mentioned in the Contract/ Tender Document but can be reasonably inferred from the Contract as being required for attaining completion, commissioning and performance of the facilities, delivering NEEGG and maintaining the plant & achieving NEEGG during O&M period of Solar PV Power Plant around GETCO substations as if such work and / or items and materials were expressly mention in the Contract without any extra cost implication and liability to GSECL. All specifications

mentioned in this Tender indicates minimum technical requirement. The Contractor may propose alternate specifications or design though the final acceptance of the same is subject to the Company’s discretion.

GENERAL SCOPE OF WORK

- The proposed location of solar project may be flat/uneven/hilly/submerged during monsoon. Bidder has to visit the site before pre bid meeting and accordingly discuss with the GSECL official for any query.
- The roads passing through the allotted land area shall be kept as it is for villagers movement & boundary wall shall be constructed on both sides of road for security point of view. Bidder shall have to execute the work of proposed solar project i.e. @ 10 MW to 55 MW in one / two / three / four pockets or more for proposed location as per the acquired government clear land, accordingly precast boundary wall of each pocket shall be provided for security point of view.
- Bidder shall have to construct Storm water drain for each pocket of proposed location. The storm water drain shall be designed by the bidder in such a way that rainy water shall not be accumulated in pocket area and discharge of the same smoothly to nearest village nalla /palika drain etc.
- If huge quantity of rainy water entered into the proposed solar project site area than bidder has to construct bund/protection wall and necessary storm water drain shall be provided for each pocket of proposed solar project site and divert the same smoothly into nearest village nalla /palika drain to avoid the damage the solar project site etc. during monsoon.
- Bidder shall have to construct road as per site requirement of proposed solar project capacity i.e. @ 10 MW to 55 MW shall be executed in one/two/three/four pocket of each location, then as per site availability for internal connectivity with each pocket necessary WBM road, culvert with site slope rubble pitching, laying NP-3 pipe of sufficient diameter wherever required etc. shall be executed as per site requirement.
- Bidder shall have to make its own arrangement for construction water as well as water required during O & M period.
- The fresh OPC53/PPC cement and TMT steel reinforcement bars Fe 500 CRS shall be used confirming to relevant I.S. Specifications of the approved manufacturers of GSECL.
- The all material, installations, fixtures, accessories etc. to be provided shall be as per the relevant I.S. specifications and of best quality and of standard manufacturer as approved by the EIC.
- Bidder shall have to keep the full proof records of purchase and consumption along with original purchase bills of Cement and Steel as per the GSECL procedures and rules.

- Bidder shall have to provide best workmanship with skilled manpower for all the civil items as per the standard specifications/ best practice as approved by the EIC. If there is dispute in the items of civil works/no standard specifications of civil work items, in that case CPWD/ PWD/ booklet of Standard specification shall be applicable. GSECL will not supply any material for this work.
- To obtain necessary approval from Govt. / semi Govt. body etc. as a statutory requirement bidder has to approach the government organization, GSECL will provide required supporting documents for the purpose.
- All such items and materials not specifically mentioned in the Contract/ Tender Document but required as per site condition during execution for completion of proposed solar project / during O & M period of Solar PV Power Plant, bidder has to execute the same without any extra cost.
- For all the civil work of proposed solar project bidder has to submit the drawing for approval of GSECL.
- Civil foundation design for Module Mounting Structures (MMS) as well as control room, inverter room, switch yard transformer / equipment shall be made in accordance with the Indian Standard Codes and soil conditions, with the help of Chartered Structural Designer having substantial experience in similar work. The Successful Bidder shall submit the detailed structural design analysis along with calculations and bases / standards.
- Module Mounting Structures Design is to be certified by Chartered Structure Engineer and certificate to be produced along with the design details for approval by GSECL. Switchyard structures / transmission line structure designs shall be strictly as per GETCO design.

The scope of work includes Operation and Maintenance (O & M) of the plant for five (5) years, where in the plant shall generate the guaranteed Performance. The Bidder shall submit in the Bid a comprehensive project execution schedule as well as Operation and Maintenance (O & M) schedule with resource planning in the form of Gantt chart, Bar chart, CPM, PERT and shall be liable for abiding by the schedule. It is the responsibility of the Contractor to perform the necessary maintenance/ timely replacement of all Civil /Mechanical or Electrical components of the project during this O&M period such that the guaranteed performance of the plant is not compromised. Any damage to CIVIL/ ELECTRICAL/ MECHANICAL components of the plant is to be reworked/ replaced/ supplied without any extra cost and time by the Contractor during complete O&M period. The Operation and Maintenance shall be comprehensive. The maintenance service provided shall ensure project functioning of the Solar PV system as a whole and Power Evacuation System to the extent covered in the Contract. All preventive/ routine maintenance and breakdown/ corrective maintenance required for ensuring maximum uptime shall have to be provided. Accordingly, the Comprehensive Operation and Maintenance shall have two distinct components as described below: