



## Terms of Reference

for

### Design, supply, installation, commissioning, and maintenance of 25 kWp of Hybrid Solar Photovoltaic (SPV) project at new municipal building of Siliguri Municipal Corporation (SMC), West Bengal

<b>Title</b>	Design, supply, installation, commissioning, and maintenance of 25 kWp of Hybrid Solar Photovoltaic (SPV) project at new municipal building of Siliguri Municipal Corporation (SMC)
<b>Project</b>	CapaCITIES Phase II
<b>Location</b>	Siliguri, West Bengal, India
<b>Timelines</b>	Publishing of ToR on ICLEI SA /CapaCITIES websites: <b>16 August 2023</b>
	Last date for acceptance of proposals: <b>30 August 2023</b>
	Identification of winning bidder: <b>01 September 2023</b>
	Award of Work Order: <b>05 September 2023</b>
<b>Tender Inviting Authority</b>	<i>ICLEI South Asia</i> C-3, Lower Ground Floor Green Park Extension New Delhi – 110016, India Tel: +91 – 11 – 4974 7200 Email: <a href="mailto:iclei-southasia@iclei.org">iclei-southasia@iclei.org</a>



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## Project Background

Capacity Building for Low Carbon and Climate Resilient City Development project (CapaCITIES) Phase II project, funded by the Swiss Agency for Development and Cooperation, aims to strengthen the capacities of Indian cities to plan and implement climate resilience actions, considering both climate change adaptation and mitigation measures in an integrated manner in key urban service sectors. The project is being implemented in 8 Indian cities namely, Coimbatore, Rajkot, Tirunelveli, Udaipur, Ahmedabad, Vadodara, Tiruchirappalli and Siliguri for implementing climate resilience actions.

ICLEI South Asia, the South Asian arm of ICLEI - Local Governments for Sustainability, is a strong and vibrant local government association with a membership base of over 70 cities in the region. ICLEI South Asia is a consortium partner of the CapaCITIES Phase II Implementing Agency, which also comprises of South Pole Group and econcept AG and is implementing the project across selected cities and states. The primary objectives of the project are to support the city and state governments to integrate climate change aspects (adaptation and mitigation) into urban planning and implementation, and to enhance the capacities of city and state governments to access finance for scaled up urban climate action.

Siliguri, as a partner city to the CapaCITIES project, has been receiving technical and funding assistance from the project in preparation of the Climate Resilient City Action Plan addressing both climate change mitigation and adaptation aspects, and in identifying and implementing pilot demonstration projects and bankable projects. As part of their engagement with the CapaCITIES Phase II project, Siliguri Municipal Corporation (SMC) expressed their interest to initiate RE plants for captive consumption in municipal buildings and services.

The intention of SMC is to deploy a pilot Solar PV (SPV) plant in one of the SMC owned buildings with technical and financial support under the project and use that experience to scale up and deploy SPV projects for other municipal services in the city to offset their energy consumption and consequent GHG emissions. To demonstrate the uptake of clean energy solutions, SMC has proposed to deploy rooftop solar PV system in their upcoming new administration building. In this regard, CapaCITIES Phase II project is publishing these Terms of Reference (ToR).

## Project Overview

### Site Description

The building where the proposed project is proposed is one of the two new administrative buildings which SMC is constructing. The proposed project is to be deployed on the building located east of the at present SMC Main Administrative Building addressed Baghajatin Road, Ward 17, Siliguri – 734001. The proposed building is four storied (G+3), wherein the terrace will be covered by a truss. The truss will be supported upon concrete columns/pillars. The SPV is proposed to be deployed on top of the truss. Siliguri Municipal Corporation will construct the truss before handing over the site for deployment of SPV.

Table 1 shows the study area, project location and other details.

*Table 1 Project Site Details*

Item	Description
Address	Siliguri Municipal Corporation, Baghajatin Road, Ward 17, Siliguri – 734001734001, West Bengal
Building function	Administrative office building



Item	Description
<b>Coordinates</b>	26°42'32.6"N 88°25'49.9"E
<b>Roof-type</b>	Truss Mounted
<b>Rooftop area</b>	About 1600 sq.ft. (length 55 feet and width 29 feet)
<b>Roof details</b>	Roof slab level at about 45 feet from the ground. Staircase lobby at 52 feet from ground in North-West corner of about 260 sq.ft. area.
<b>Truss Height</b>	12 feet (approx) above terrace floor
<b>Sanctioned load</b>	45 kVA (tentatively proposed contracted load) for the building. To be finalised and installed post construction of the building. Proposed contracted load may change post building construction.
<b>AC load identified for battery back-up</b>	25 kW
<b>Back-up hours</b>	2+

## Brief Scope of Work

ICLEI South Asia, on behalf of Siliguri Municipal Corporation, invites bids from qualified contractors in two stages for the work of Design, Supply, Installation & Commissioning, and Maintenance of 25 kWp (DC) hybrid Solar PV (SPV) plant at new SMC building located east of SMC Main Administrative Building, Baghajatin Road, Siliguri, West Bengal, referred as ‘new SMC building’ hereinafter. Based on the proposals received and further evaluation, bidder will be selected and given the work order. Successful bidder will be invited by the CapaCITIES project team members to visit the site and submit the detailed proposal for Engineering, Procurement, Construction (EPC) and two (2) years of Operation and Maintenance (O&M).

The successful bidder, hereinafter referred to as the “Contractor” needs to set up a hybrid Solar PV Power Plant at new SMC building with tentative total capacity of 25 kWp (DC) Power Plant including but not limited to the scope of works given below. The hybrid solar PV system is proposed with approximately 50 kWh lithium iron phosphate (LiFePO4) chemistry-based battery back-up and with the inverter having functionality for grid-integration to avail Net-Metering facility in future. The Contractor shall perform all the tasks required for successful commissioning and O&M of the SPV project:

1. Engineering, Procurement, importing, transportation to site, storage at site,
2. Site development, Construction, Erection and Installation of equipment, Testing and Commissioning of the 25 kWp (DC) hybrid SPV project.
3. Demonstrate assured performance of the Plant as specified in the bidding document,
4. Operate and maintain the plant for 2 years which is also a Defect Liability Period (DLP), effective from the date of commissioning or Commercial Operation Date (CoD).

**Note:** Successful bidder shall be requested to conduct site visit and submit the project proposal as per the site feasibility study.

## Details of Tasks

The scope of work shall include Designing, Planning, Engineering, Procurement (Manufacturing / Supply), Construction, Erection and Installation of Equipment, Testing, and Commissioning of the 25 kWp (DC) hybrid Solar PV Plant with lithium-ion based 50 kWh storage and net-metering capability

(hereinafter called as hybrid SPV) as a Turnkey Contract according to terms and conditions set out in this document.

The hybrid SPV should be designed, installed, and commissioned as per technical specifications provided in Section 3, and in conformance with IEC Standards as applicable for all the equipment including but not limited to Solar PV Modules/Panels, solar PV inverters, fuses, junction boxes, surge arresters, cables, earthing, energy meter and mounting structure; considered for the project implementation such as IEC – 61853, 61727, 61730, 61215, 60904, 62109, etc. or currently available standards which ensure the best performance. The contractor shall also be responsible for operation and maintenance of the Project for a period of two (2) years.

The Turnkey contract for the hybrid SPV shall be in accordance with all applicable permits and regulations set out by the Government of India, and Government of West Bengal. The hybrid SPV should fulfil the minimum Guaranteed Performance and the Technical Specifications presented in this document. The contractor shall be responsible for, but not limited to, the following scope of works:

1. Submit detailed design proposal, inclusive of all necessary and allied works for operationalizing/commissioning of the proposed SPV project that will be undertaken by the contractor, at their own cost, with clear timelines.
2. Basic project planning, sequencing, and scheduling, energy yield prediction, basic and detailed engineering, project component selection, preparing engineering and construction drawings, availing planning permissions, and all other requirements as required for commissioning and interconnecting the hybrid SPV to the existing electrical distribution system.
3. The contractor must submit the Project design proposal and schedule within seven (7) days from the date of award of work order. The project schedule comprising of all key milestones till Provisional Plant Acceptance shall be submitted.
4. Material supply and at site work should commence within one week of acceptance of project design proposal.
5. Submission of the drawings and documents as per the deliverables listed in the project schedule and as agreed between the contractor and ICLEI South Asia for approval.
6. The Contractor can only proceed for the procurement of the major components of the solar PV plant only after prior approval from ICLEI South Asia and SMC.
7. Supply, sourcing, procurement, transportation including requisite insurance of all solar PV plant equipment.
8. The contractor to include standard fire and perils insurance specifications and quotation along with the specified technical and financial bid and will be taken forward based on the preference of SMC.
9. The contractor shall submit all relevant system Single Line Diagrams (SLD), drawings, SPV system performance certificates, etc. to ICLEI South Asia and SMC for review and approval.
10. The contractor shall obtain all permits and clearances from all local stakeholders, including government statutory bodies, Electrical Inspectorate etc. as required for completion and commissioning of the hybrid SPV.
11. Every work shall be supervised by the contractor deployed Supervisors and will report to the concerned person or representative of ICLEI South Asia or SMC.
12. Assembly and construction of the entire solar PV plant, all pre-construction tests if required, site management and supervision, labor provisions, testing and commissioning of all equipment in steps including commissioning and interconnection of the hybrid SPV to the existing electrical distribution system.



13. Labels shall be clearly visible on various equipment, placed to remind the operator that the device should be accessed with caution as there could be an energized part that comes from the indirect renewable energy generation system.
14. All the operations not expressly included, that are necessary for proper functioning of the hybrid SPV and fulfilment of the guaranteed performance, rules, regulations, and applicable codes, being the meaning of necessarily all these things which are inherent to the Project and without which the solar PV plant would be unable to start operating in Captive mode in synchronization with existing system.
15. Commissioning of the solar PV plant with Provisional Acceptance Test, seven (7) days Start-Up Performance Test, and once a year in the O&M period of 2 years.
16. Annual Maintenance Contract shall be signed for the operational and maintenance period of 2 years between ICLEI South Asia and the contractor.
17. Comprehensively warranting the entire solar PV plant against all defects through a Defect Liability Period (DLP) of 2 years which is also the part of O&M services for two (2) years, transfer all component warranties, spare parts and tools and tackles to the SMC post completing the DLP and O&M period.
18. Further to commissioning of the hybrid SPV project; training SMC's Personnel for Operation and Maintenance, handing-over the plant to SMC, provision of all the documentation necessary for the correct performance and maintenance for the lifetime of solar PV plant.
19. Operation and Maintenance of the PV plant post commissioning up to two (2) years (including Defect liability Period). During the Defect liability Period and O&M period of two (2) years, the Contractor shall supply all necessary equipment/spares, materials, manpower for replacement of faulty equipment at their own cost.
20. The EPC Contractor shall be the O&M Contractor for two (2) years from the Date of Commissioning (CoD). The O&M Contractor shall follow the plant Health Safety and Environment (HSE) requirements and provide all the required harnesses, tools & tackles, consumables etc. at their own cost.
21. The Contractor shall make his own arrangement for material storage. The space shall be provided by the SMC. The security of materials is Contractor's responsibility. The Contractor must make suitable arrangements for its own and its sub-contractor's (if applicable) employees during construction and O&M period.
22. Contractor shall submit the list of activities and procedures that will be undertaken during the O&M period.
23. The Contractor shall remove left over construction materials and debris from site within one week of achieving CoD.
24. The Contractor shall make its own arrangements for material lifting to the project execution area.
25. The Contractor shall be responsible for the title transfer of the plant to the SMC prior to Provisional Plant Acceptance.
26. The Contractor shall depute licensed (with local distribution company) electrical contractor for performing the electrical LT/HT side works if required.
27. The bidder shall be responsible for assuring that all commodities shipped are properly packed and protected to prevent damage or deterioration during shipment. Packaging and shipping costs shall be borne by the supplier. Customs clearance and all costs and actions associated with import duties, taxes, and processing of documents within India are borne by the bidder. Transportation, loading, unloading at site is in the scope of bidder.
28. O&M activities primarily include but not limited to, 8 servicing each after 3 months. (panel cleaning, system checking, report generation, troubleshooting) excluding the responsibilities of the



vendor during the Defect Liability Period to rectify or replace defective components and installation errors.

29. ICLEI South Asia reserves the right to terminate the work order, at any given time, in the event of contractor showing lack of attendance to the work or negligence or sub-par/unfair performance in the opinion of Engineer-In-Charge of Siliguri Municipal Corporation or ICLEI South Asia, irrelevant of any clause of the contract/work order by giving suitable notice to the contractor. The security deposit shall not be returned to the contractor in such case.

## Technical Requirements and Bill of Quantities

### Technical Specifications for the Hybrid SPV Project

The pilot hybrid SPV project of tentative capacity 25 kWp (DC) is to be installed in the SMC administration building in the area identified as shown in the layout presented in Table 1. The area considered for the pilot project is approximately 160 square meters wherein the solar panels shall be mounted on the truss as prescribed. Mounting equipment and fixtures of solar panels shall be of high-quality material and strength, suitable for the truss structure members and shall withstand the climate conditions of Siliguri.

The renewable electricity generated from the hybrid SPV project shall be used to meet SMC's load and charge the battery. The inverter or power conditioning unit (PCU) of the system shall have grid integration functionality to ensure avail Net-Metering facility in future. As of now, Net-metering policy is sub judice in West Bengal.

#### Electrical Characteristics

**DC System:** This shall essentially be applicable from solar PV Modules up to the Inverter. The operating voltage of Inverters shall essentially depend upon the Maximum Power Point Tracking (MPPT) range. The exact number of strings and number of modules in a string should be decided during the detailed engineering.

It is crucial to be noted that module string connections to be designed considering minimum loss arising due to shadow or such issues which may impact the system performance. For instance, solar panels to be mounted on truss surface facing south, shall be connected in a string to maximise the yield and should not be combined with panels facing north or other direction which may result in lesser energy yield.

All individual input terminals of Inverter shall have disconnection facility. Solar grade DC cables shall be provided for interconnection between Modules and input terminals of Solar Inverter. A string Inverter with DC input fuse, DC side SPD, and string level monitoring features shall be selected.

The inverter shall be hybrid in nature wherein, it has the facility to charge the battery pack and has the facility for grid-tied operation. As noted earlier, West Bengal's Net-Metering policy would come in effect, therefore proposed inverter should be able to export the excess energy to the grid while charging the batteries at the same time. Priority will be given to captive consumption first.

In case of absence of DC power full or partial, inverter shall synchronise with GRID and Battery pack to supply required power to the loads identified. To keep batteries health well, inverter can charge batteries through grid with minimal charging current. Priority of batteries charging through solar energy shall be given.





**Battery back-up and battery management system:** Contractor shall consider Lithium Iron Phosphate (LiFePO<sub>4</sub>) batteries while designing the battery backup for the hybrid SPV system. Selected battery system shall be equipped with appropriate battery management system (BMS) which ensures safe and required performance. It is crucial that the selected battery pack and BMS is compatible with rest of the balance of system components, especially with the inverter and can communicate for uninterrupted operation of the entire solar system. The battery pack of 50 kWh shall be designed with appropriate number of batteries and their series/parallel combinations to match with inverter input requirements. The details of loads to be connected to the battery set, will be finalised after the site visit undertaken by shortlisted bidder and shall then be included in the final system proposal/bid. After the site visit, contractor shall seek approval from SMC and ICLEI South Asia team for the loads to be considered for battery-backup.

**AC System:** The recommended point of connection shall be at utility meter of the SMC building. The AC cable type and size shall be selected based on the power, voltage rating, route length and laying pattern and all AC cables shall be XLPE, FRLS & armored. Considering safety and smooth operation and maintenance of system, necessary disconnects, circuit breakers, SPDs shall be installed as per the prevailing standards and West Bengal state electricity board regulations.

At inverters output end, there should be at least overcurrent, type-II overvoltage, under/over frequency, insulation fault monitor and anti-island protections. The fault current contribution by the inverters is usually limited by the inverter control circuit and this should be based on IEC 61727 or IEEE 1547. The Energy Meter with suitable accuracy level is recommended as per metering standard of Central Electricity Authority (CEA) and guideline of West Bengal State Electricity Distribution Company (WBSEDCL) for metering. The grid interconnection of the hybrid SPV plant to the grid at SMC building's utility meter has to be carefully assessed by the Contractor during bidding stage.

The earthing system is divided into three parts; DC, AC and lighting Arrester (LA). Earthing of PV module and module mounting structure are considered under DC earthing, and inverters, utility panel and AC side equipment for power evacuation are considered under AC earthing. Separate earth pits has to be provided by the Contractor for DC, AC and LA. Earthing of each LA in case of ESE type has to be considered under LA earthing. The required number of earth pits has to be calculated to limit effective earth resistance under 1  $\Omega$  in any event within applicable norms and standards and good practice. ESE type LA of 107 m or more range recommended to protect complete PV array in the solar system site area. The location of LA to be decided considering the coverage area, shadow impact and ease of installation. However, the Contractor is free to select conventional type LA for which the required quantity of LA has to be calculated as per applicable standard.

## **Interfacing Facilities**

The EPC Contractor shall provide the interconnection till the utility meter of SMC building. The hybrid SPV project shall operate in synchronisation with WBSEDCL's grid. The general guidelines for the interconnection arrangement shall be as follows:

1. Evacuation facilities from the point of generation at inverter end to the interconnection point including the required metering, and protection arrangement at the interfacing point shall be new and properly designed as per applicable codes and standards;
2. All the equipment required for interfacing such as panel, cable, jointer kit, automatic transfer switches etc. shall be provided by the Contractor;

3. The interconnection shall be as per CEA (Central Electricity Authority) "Technical Standards for Connectivity of the Distributed Generation Resources 2007" and amendments thereafter and any other applicable codes and standards.
4. Metering arrangement shall be as per CEA (Installation and Operation of Meters) (Amendment) Regulations and amendments thereafter.

### Climatic Conditions

There has been no onsite monitoring of weather parameters till the time of releasing this document. Desktop assessment indicates that the following conditions may be considered by the Contractor for the project component selection and system design:

1. All equipment shall be designed for 50°C Ambient Temperature and considering Siliguri' climate.
2. 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, as well considering the height of the building and type and roof design. As per IS-875 standard, the basic wind speed of the location is 47 m/sec. All structures on the rooftop and anchoring have to be designed considering the IS-875 structural design requirements. Fixtures to be used for fixing solar panels and truss members shall be of relevant type and design suitable for truss installation.
3. The seismic forces has to be estimated and considered as per the provisions of IS: 1893 Part 1.
4. Relative humidity, which ranges from 70% to 94% on an average during the dry and wet months respectively, is to be considered for the design and equipment selection.

### Bill of Quantities

The equipment and material for 25 kWp (DC) Hybrid Solar Photovoltaic Power Plant with associate systems (typical) shall include, but not limited to the following:

Items	Item description	Preferred make
PV module	Mono PERC C-Si Modules	Tier-1 and ALMM by MNRE
Inverter	Min. 25 kW, hybrid solar string inverter with battery and grid integration facility (Net-Metering facility). 1000 V DC, 3-ph, 50 Hz, multiple Multi Power Point Trackers (MPPTs), Surge Protection Device (SPD) type - II (DC and AC)	SunGrow / Huawei / SMA / Delta / reputed make
Battery	Lithium Iron Phosphate (LiFePO4) type with Battery Management System approved by relevant IEC/BIS standards and agencies such as MNRE.	Tier-1 brand
Battery enclosure	Battery placement/housing rack	Reputed make with necessary safety arrangements
Bus Bars and Automatic Transfer Switches (ATS), accessories.	All required cabling, ATS, bus bars with enclosures for load segregation, distribution and connections for seamless operation of battery system and concerned loads connected.	Reputed make with necessary safety arrangements



Module and equipment mounting accessories	Aluminium, Stainless Steel of suitable grade Hot dip galvanized / Aluminum clamp arrangement for Inverter mounting	Reputed make- Tier-1 quality adhering to MNRE standards
DC cable	Sizing and specifications As per IEC 62930 or relevant standard 1Cx4mm <sup>2</sup> , Cu, XLPO, FRLS, 1.5kV grade	Leoni/Lapp/reputed
MC4 connectors	IP67	Staubli/Leoni/MC/Reputed make
AC cable	Sizing and specifications As per IEC XLPE, FRLS AR protections and quality	Polycab/Havells/Seichem/RR Kabel
Control cable	Shielded RS485	Belden/reputed make
Earth pit	Appropriate size and make- Cu bonded rod, maintenance free earth enhanced material, cast iron pit cover and accessories.	Reputed make
Earthing cable	Module to module - Cu cable, Inverter earthing and other BoS components as prescribed in standards	Polycab/Havells/Seichem/RR Kabel
Lightning Protection System	Early Streamer Emission (ESE) air terminal type lightning arrester with 100 m radial coverage.	Reputed make
Miscellaneous	Fire extinguisher, lighting system, auxiliary supply system, <b>signages</b> , lugs, cable ties, cable trays, thimbles, sleeves, cable identification tags, wall anchors, conduits, connectors, cable	Reputed make

## Eligibility Criteria and Bid Submission

### Eligibility Criteria for Bidders

#### General Conditions:

1. The contractor should be a body incorporated in India under the Companies Act, 1956 or 2013/NGO/Proprietorship/Partnership/LLB firm & shall be in operation for the last three years.
2. If the contractor ceases to meet the eligibility criteria or the qualification criteria set out in the tender at any time after the application due date and on or after the bid due date, then such contractor shall be disqualified, and its bid shall be liable for rejection.
3. ICLEI South Asia reserves the right to assess the capabilities and capacity of the Contractor / his collaborators / associates / subsidiaries / group companies to perform the contract, should the circumstances warrant such assessment in the overall interest of the project.
4. ICLEI South Asia reserves the right to reject any or all bids or cancel/ withdraw the Terms of Reference (ToR) without assigning any reason whatsoever and in such case no contractor/ intending contractor shall have any claim arising out of such action.



5. The contractor may sub-contract part of his deliverables to another agency. In such case, prior information of the same must be provided to ICLEI South Asia at the time of bid submission. The information of such intention must be sufficed with suitable letter of authorization from sub-contracting agency expressing their consent to work on behalf of the bidding contractor.
6. In case the contractor wishes to sub-contract part of the deliverables, the final responsibility of delivery and performance lies solely with the contractor.
7. The participating contractor may be a single entity or a group of entities, the “Consortium”, coming together to execute the project. Hereinafter, the word ‘contractor’ used would apply to both single entity and a consortium.
8. In the event the contractor is a consortium, it shall, comply with the following additional requirements:
  - a. Number of members in a consortium shall not exceed 2 (Two) including the Lead Member
  - b. The members of the consortium shall nominate one member as the lead member.
  - c. The members of the consortium shall be responsible for successful implementation of the project throughout the terms of the contract.
  - d. The lead member shall be 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 this Bid.
  - e. The consortium agreement should be submitted with the bid.
  - f. The agreement should be on stamp paper and duly notarized, members should be jointly and severally responsible.
  - g. The consortium should jointly fulfill Eligibility Criteria & pre-qualification criteria mentioned in the document.
  - h. The consortium agreement should clearly mention the roles and responsibilities of each company in the consortium and the percentage share of each member.
  - i. The consortium agreement should mention the lead partner in the consortium.
9. If the contractor ceases to meet the eligibility criteria or the qualification criteria set out in the tender at any time after the application due date and on or after the bid due date, then such Contractor shall be disqualified, and its Bid shall be liable for rejection.
10. ICLEI South Asia reserves the right to seek information and evidence from contractors regarding their continued eligibility and continued compliance with the Qualification Criteria at any time during the bid process. The contractor shall undertake to provide all the information and evidence sought by ICLEI South Asia and SMC.

### Technical Eligibility Criteria:

1. The Contractor should have **installed and commissioned SPV project(s) of cumulative capacity at least 500 kWp of rooftop solar PV experience as an EPC contractor**, which should have been commissioned within the last 60 months prior to the Bid Submission date.
2. The contractor should have installed hybrid solar PV systems with Lithium Iron (LiFePO<sub>4</sub>) battery back-up of cumulative capacity of 200 kWp across India as an EPC contractor which should have been commissioned within the last 60 months prior to the Bid Submission date.
3. The Contractor shall submit, in support to the above, the list of projects commissioned within the last 36 months along with their work order/ LOI/Commissioning certificates and the letter from Client/Employer/Owner confirming satisfactory performance of the Plant.
4. The certificates shall be in English language with mentioning the name of power plant, capacity, contract date and commissioning date of the power plant (make and model of components) supplied

by the Contractor; issue date, name, and address (Telephone/Fax/e-mail) of the end user duly signed in the official letter head.

5. The contractor shall have at least 5 years' experience in implementing any renewable energy (RE) installation work, preferably Solar PV projects.

### **Financial Eligibility Criteria:**

1. An eligible bidder should have a total turnover of at least INR 3 Crore in the last 5 financial years ending March 2023 (cumulatively over 5 years).
2. The Contractor will provide a copy of the audited annual report for each of the previous three financial years to ascertain their turnover.
3. The contractor should have GST/VAT registration and up-to-date TIN certificate and should comply to all applicable financial regulations for operating in India.

## **Bid Submission**

### **Documents to be submitted by bidders**

1. The contractor shall possess a valid registration certificate for the said firm.
2. The contractor shall submit GST/VAT registration, up-to-date TIN certificate and all relevant financial & registration documents declared by relevant authorities of Government of India for organization to operate in India.
3. The contractor must not have defaulted under any of the applicable Acts like Income Tax, GST Act, PF & ESI Act or any other Act which as per the nature of contract is required (Declaration/Return Copies to be furnished).
4. Last 3 Financial Year's balance sheet audited by a certified Chartered Accountant.
5. Details of similar work previously carried out, mentioning Beneficiary, Capacity of Installation, Contract Value, Date of Commencement, Date of Commissioning, Contact details (with telephone no.) of contact person for the given contract etc. shall be provided.
6. Technical Specifications (TS) Technical document with all relevant enclosures for all equipment as listed in Section 0
7. Details of the key technical personnel (technical personnel must include anchoring & mooring design engineer, electrical engineer, civil engineer) whom the contractor shall engage for this project. Please include their resume providing name, qualification, nature of work (field or office), mode of employment, previous experience.
8. The contractor shall produce original documents for cross verification as and when requested by ICLEI South Asia.
9. Each page of all the documents mentioned above as well as technical and price bid documents shall be duly signed by the contractor.

Financial proposal for the scope mentioned above and comprising all the minimum technical components as specified in Section 0. The unit cost of each component should be mentioned as per the BOQ. The financial bid shall be inclusive of all the costs including taxes associated with the project. It is clarified that, for the purposes of evaluation, the financial bid should be prepared in Indian Rupees (INR). In submitting the price bid, the Consultant shall adhere to the following requirements:

1. The price quoted shall be fixed and firm and not subject to any escalation or variation. The price should be inclusive of all transportation and installation charges including all required material to successfully complete tasks, duties & taxes, insurance and as per the format given in Annexure 1.



2. Bill of materials for the hybrid SPV system as indicated in Section 0 should be provided along with the price bid format as given in Annexure 1.
3. The contractor shall submit a separate quotation for conducting annual O&M of the plant for 2 years along with the financial bid.
4. Contractor shall provide tentative cost for availing Net-Metering facility including the procurement of bi-directional meter certified by WBSIEDCL.
5. ICLEI South Asia reserves the right to modify the final size and components of the hybrid SPV system at the unit rate quoted by the contractor.
6. All or any accessories/consumables/items required for satisfactory commissioning of the work shall be deemed to be included in the contract and shall be provided by the contractor without extra charges.

### Contact Information for Bid Submission

1. The Terms of Reference (ToR) shall be downloaded free of cost from the [ICLEI South Asia](#) and [CapaCITIES](#) project websites.
2. The bid documents consisting of both technical and financial bids, and the supporting documentation shall be submitted by contractor through email to the below mentioned email IDs on or before last day of acceptance of proposals:
  - a) **Soumya Chaturvedula, Deputy Director, ICLEI South Asia**  
(Email: [soumya.chaturvedula@iclei.org](mailto:soumya.chaturvedula@iclei.org))
  - b) **Souhardo Chakraborty, Assistant Manager (Energy & Climate), ICLEI South Asia**  
(Email: [souhardo.chakraborty@iclei.org](mailto:souhardo.chakraborty@iclei.org))
  - c) **Shardul Venegurkar, Assistant Manager (Energy & Climate), ICLEI South Asia**  
(Email: [shardul.venegurkar@iclei.org](mailto:shardul.venegurkar@iclei.org))
3. For any queries, please write to the below mentioned email contacts for clarification at least 3 days in prior to the last date of bid submission:  
[souhardo.chakraborty@iclei.org](mailto:souhardo.chakraborty@iclei.org)  
[shardul.venegurkar@iclei.org](mailto:shardul.venegurkar@iclei.org)
4. The bid shall be valid for a period of 60 days from the date of submission of the bid document.
5. A contractor shall submit the bid documents that satisfies every condition laid down in this notice, failing which, the bid will be liable to be rejected by ICLEI South Asia.

## Instruction to Bidders

### General Instructions

1. The bidder shall be deemed to have carefully examined the work and site conditions. In this regard, bidder will be given necessary information to the best of knowledge of ICLEI South Asia in consultation with but without any guarantee to it.
2. If bidder shall have any doubt as to the meaning of any portions of the scope of the work, or any other matter concerning the contract, bidder shall in good time, before submitting his tender, set forth the particulars thereof and submit them to the point of contacts, as given in Section 0 this TOR, by email in order that such doubts may be clarified authoritatively before tendering. ICLEI South Asia will respond to queries until 3 days prior to the deadline for the submission of proposal. Once a tender is submitted, the matter will be decided according to the tender conditions in the absence of such authentic pre clarification.
3. The contractor/ bidder shall address all aspects of the proposed outputs and deliverables mentioned in this TOR.



4. The comments and suggestions provided by the bidder on the TOR are not binding and shall not affect the financial proposal.
5. It should be noted that the project is being implemented in areas under the jurisdiction of SMC, and hence instructions to bidders will be given by ICLEI South Asia in consultation with officials from the SMC. ICLEI South Asia will be overall in-charge of all the work that would be executed under the present scope of work.

## **Tender Evaluation & Bid Assessment**

- 1 The bids received will be scrutinized & evaluated by ICLEI South Asia, and if required, in consultation with senior city officials from SMC involved in the execution of the project.
- 2 The bids will first be evaluated to determine responsiveness to the ToR. A Bid shall be considered responsive only if:
  - a) the Bid is received by the Bid Due Date, including any extension thereof,
  - b) it is signed, sealed, and marked as stipulated in ToR,
  - c) it contains the following information and documents (complete in all respects) as requested in this ToR:
    - Technical bid
    - Financial bid
    - Supporting documents
- 3 ICLEI South Asia shall evaluate and determine whether the contractors have submitted a technically responsive bid. The decision of ICLEI South Asia shall be final with respect to the selection of the qualified bidders. If required, clarification or additional documents from the contractor shall be sought.
- 4 ICLEI South Asia will inform those contractors whose proposals did not meet the minimum qualifying requirements or were considered technically non-responsive to the terms of reference and their Price Bids will not be opened.
- 5 Total Contract Value quoted by each qualified Bidder that has submitted a substantially responsive Financial Proposal will be tabulated and shall be checked for arithmetical errors. If there is a discrepancy between words and figures quoted as the Total Contract Value, then the amount in words shall prevail.
- 6 Based on an evaluation of the detailed system design proposals, one (1) contractor will be selected to undertake the tasks outlined in the scope of work. For seeking any further clarification/s a meeting would be called virtually or individually, if desired, in which case the contractors shall be informed accordingly.
- 7 Selection of the qualified contractor to undertake the work detailed in this ToR shall be a techno-commercial decision based on price negotiation, and agreed terms and conditions as per the contract.

## **Award of contract**

- 1 Detailed Work Order will be issued to the winning contractor tentatively within 3 days of announcing the winning contractor.
- 2 The winning contractor is to forward the signed and sealed work order to ICLEI at the earliest or not more than 5 (five) days of issue of work order. Hard copy of the signed contract/work order and the bid documents shall be sent to the ICLEI South Asia office address as mentioned below:

**Soumya Chaturvedula, Deputy Director, ICLEI South Asia Secretariat,**



### **C-3, Lower Ground Floor, Green Park Extension, New Delhi - 110016, India.**

**Tel: +91 – 11 – 4974 7200 Fax: +91 - 11 - 4974 7201**

- 3 In case the winning contractor fails to indicate his intent to undertake the said work within the stipulated time of 3 (three) days and observe the formalities as above, the Letter of Intent will be cancelled, and the next contractor will be finalized by ICLEI South Asia in Consultation with senior city officials.
- 4 After selection of the qualified bidder, ICLEI South Asia will issue the Letter of Award (Work Order) to the selected contractor in duplicate:
  - a) declaring it as the successful contractor,
  - b) accepting its Financial Proposal,
  - c) requesting it to fulfil the condition specified in the tender,
  - d) requesting it to pay the Performance Security in accordance with the tender,
  - e) subject to fulfilment of the conditions specified in the ToR, requesting it to execute the Contract within specified timelines.

## **Performance Guarantee for Construction and Operation & Maintenance**

### **Performance guarantee for EPC Contract**

1. The contractor shall submit a Performance Security of 5% of total Contract Value in the form of an irrevocable and unconditional bank guarantee issued by any scheduled Bank of India payable in favor of ICLEI South Asia and payable at New Delhi.
2. The Performance Security or the Performance Bank Guarantee shall remain valid till one (1) month post Plant Acceptance (estimated as three (3) months from the date of award of contract).
3. A refund of the Performance Bank Guarantee shall be made within Thirty (30) days from the date of Plant Acceptance post commissioning of the hybrid SPV and receiving a provisional plant acceptance letter from ICLEI South Asia / SMC.
4. In the absence of live load on the solar PV system, bidder shall make arrangement to undertake system performance testing using dead/temporary loads at site.

### **Performance guarantee for O&M Contract/AMC**

1. Upon commissioning, prior to refund of the Performance Bank Guarantee for the EPC contract, the contractor shall submit a second bank guarantee of 10% of the total cost of annual O&M contract in the form of an irrevocable and unconditional bank guarantee issued by any scheduled commercial bank payable in favors of ICLEI South Asia as a Performance Bank Guarantee for the O&M Contract.
2. In case, the bidder is unable to generate minimum generation guaranteed units (as per the clauses mentioned in “Plant Performance Guarantee” sub-section of this ToR), measured over a quarter period, then, SMC shall have the right to recover it from the O&M performance security.
3. The Performance Security or the Performance Bank Guarantee during O&M shall remain valid till one (1) month post Plant Acceptance and Handing Over – Taking Over post the 2 years of O&M. A refund of the Performance Bank Guarantee shall be made within Thirty (30) days from the date of Plant Acceptance and completion of Handing Over – Taking Over, post the O&M period of 2 years.

## **Execution of Contract and Payment Schedule**

1. The contractor shall execute the EPC contract signed with ICLEI South Asia within 10 weeks of issuance of the Work Order.



2. The contractor shall submit the Performance Bank Guarantee for EPC Contract to ICLEI South Asia within 7 days of award of work order.
3. The contractor shall submit the detailed project Schedule within seven (7) days from the date of award of work order. The contractor shall provide the project schedule along with a detailed work plan comprising of all key milestones till Provisional Plant Acceptance, list of engineering deliverables, conceptual project layout, conceptual Single Line Diagram (SLD), and make and model of key components of project.
4. If the contractor fails to satisfy the above conditions or fails to execute the Contract on or before the date stipulated in the Work Order, ICLEI South Asia has the right to disqualify the contractor and revoke the Work Order.
5. If, after the execution of the Contract, the successful contractor fails to fulfil any of the conditions precedent to the effectiveness of the Contract, ICLEI South Asia may terminate the Contract and encash the performance guarantee.
6. The payment schedule for the EPC contract will be as per the schedule mentioned below:  
**Payment Schedule:** Payment will be made within 15 days from the date of submission of invoice accompanied by an acceptance certificate/ letter from ICLEI South Asia and photographs depicting work progress printed in color.

Milestones		Payment Terms
1	Completion of detailed engineering and approval of all design documents by ICLEI South Asia and SMC	30 % of Total Contract Value
2	Receipt of PV modules and other components at site and acceptance by the ICLEI South Asia and SMC	20 % of Total Contract Value
3	Mechanical completion of the Project and confirmed by ICLEI South Asia and SMC	20% of Total Contract Value
4	Provisional Plant Acceptance by ICLEI South Asia and SMC	10% of Total Contract Value
5	One month after Commercial Operations Date (date of generation of units for use of SMC)	20% of Total Contract Value

## Terms of Contract

### Contractor Obligations

In addition to obligations of the contractor specified elsewhere in other sections, the contractor shall be bounded by the following basic obligations:

1. Adherence to all the sections of this document along with all the drawings is essentially a key obligation of the contractor.
2. The contractor shall independently conduct resource assessment and predict energy yields clearly specifying losses and degradation over Project lifecycle. ICLEI South Asia and SMC shall closely monitor these losses / degradations and shall link these parameters with the Project performance.
3. The contractor shall be responsible for required liaison with WBSEDCL, SMC and other local bodies as per requirement for approvals, permits and clearances, including any application, charges/fees that may be payable.



4. Wherever standard codes are referred to in this document, the same shall be followed by the Contractor. Wherever standard codes are not mentioned, the latest relevant BIS, IS, NEC, IEEE and IEC codes and standard shall be followed.
5. The Project being a Turnkey Contract, the scope shall include everything as required for successful implementation, commissioning and operating the plant for its lifecycle of at least twenty-five (25) years. No variation shall be entertained on this account by ICLEI South Asia or SMC.
6. The Contractor shall perform works strictly adhering to technical documents and drawings approved by ICLEI South Asia as well as requirements established by the applicable technical regulations.
7. The Contractor shall follow and perform all works in accordance to this technical document, State Solar policies and regulations, Ministry of New and Renewable Energy (MNRE) guidelines, CEA "Technical Standards for Connectivity of the Distributed Generation Resources 2013" and subsequent amendments thereof, "CEA technical standard for Installation and Operation of Meters 2013 and subsequent amendments thereof.
8. The Contractor shall strictly follow the start-up and functional requirements of the Project; this shall essentially include all the material and construction equipment supply, implementation, testing and commissioning of the relevant systems as required for successful completion, and commissioning of the project.

The Contractor's obligations in respect of the EPC work shall include performing all works and provision of Contractor's Equipment for the Design, Engineering, Procurement, Construction, Installation, Connection, Testing, Start-up, and Commissioning of the Plant at the Site in accordance with the Laws and this document.

### **Penalty for delay**

1. Time is the essence of the contract and as such all work shall be completed within the time stipulated in the contract/ work order.
2. If the bidder, without reasonable cause or valid reasons, commits default in completing the work within the aforesaid time limit, ICLEI South Asia shall without prejudice to any other right or remedy, be at liberty, by giving 15 days' notice in writing to the contractor to commence the work, to forfeit the balance payment depending on the status of work, and to cancel the Work Order.

### **Extension of date of completion**

On occurrences of any events causing delay as stated hereunder, the bidder shall intimate immediately in writing to ICLEI South Asia-

#### **Force Majeure:**

1. Natural phenomena, including but not limited to abnormally bad weather, unprecedented floods and draught, earthquakes & epidemics.
2. Political upheaval, strikes, lockouts, acts of any Government (domestic/foreign) including but not limited to war, properties, and quarantine embargoes.

**Please note** that this clause will only account if an event occurs during site surveys / construction / commissioning period.

### **Materials/Appliance at site**

1. Neither ICLEI South Asia nor SMC undertake any responsibility for supply of any materials/



equipment/ Appliance/ tool for site analysis to the bidder.

2. All materials/ equipment/ tools brought to site by the bidder shall be the responsibility of the bidder. SMC and ICLEI South Asia shall extend help as and when approached by the bidder to keep/store any materials/ equipment/ Appliance/ tool, however not liable for any loss, theft, or damage due to fire or other cause, the responsibility for which shall lie entirely on the bidder.

## Photographs

To observe the progress of work at different stages of execution of works Contractor shall take out colored photograph at 3 stages i.e., 1) Before execution 2) During execution 3) After completion of work. Contractor shall take out at least 15 photographs of each sub works at each stage. The photographs shall be submitted in soft format arranged as per the stages described while the work is on-going and as well as at the time of invoicing. No extra cost shall be paid to Contractor on this account.

## Site Inspection

ICLEI South Asia or its authorized representatives, reserve the right to inspect the project components, as per project schedule to ensure compliance of the quality of Components/ material as per the specification and data sheet before dispatch to site. ICLEI South Asia at its own discretion will visit the premises for inspection with prior intimation to the Contractor. It is the responsibility of the contractor to inform ICLEI South Asia at least 7 days prior to the dispatch of the project equipment. All administrative expenses for ICLEI South Asia or its authorized representatives, will be borne by ICLEI South Asia for above inspections. However, all the expenses related to testing and inspection at manufacturer/ supplier premises or at project site shall be borne by the contractor only.

## Liability

ICLEI South Asia may, upon written notice of default to Contractor, terminate the contract in circumstances detailed hereunder:

- If in the judgment of ICLEI South Asia, Contractor fails to complete within the time specified in the contract or within the period for which extension has been granted by ICLEI South Asia in writing in response to written request of Contractor, &/ or,
- If in the judgment of ICLEI South Asia, Contractor fails to comply with any of the provisions of this contract.

In the event ICLEI South Asia terminates the contract either in whole or in part, ICLEI South Asia reserves the right to purchase upon such terms and in such a manner as deemed appropriate work similar to those terminated and Contractor will be liable to the SMC for any additional costs for such similar work and/or for penalty for delay until such reasonable time as may be required for the final completion of work

## Confidentiality

All data and information received from ICLEI South Asia and SMC for the purpose of this work order are to be treated confidentially and are only to be used in connection with the execution of these Terms of Reference. The contents of written materials obtained and used in this assignment may not be disclosed to any third parties without the expressed advance written notice of ICLEI South Asia.

The documents/ report generated during the work order and submitted to ICLEI South Asia will be jointly owned by SMC, ICLEI, and Contractor and will be exclusively used for the purpose of this work order only.



## Procurement

The Contractor shall be responsible for proper receipt, inspection, unloading and security of all materials in accordance with the Laws and the Contract. The procurement shall be started after approval from ICLEI South Asia and SMC.

## Installation

The Contractor shall complete design of the solar system, structures, civil, mechanical, and electrical Works required for the installation of the Plant and secure approval of the same from SMC and ICLEI South Asia prior to commencing execution at site. The Contractor shall install all equipment in accordance with the applicable laws/ rules. EPC contractor shall ensure that installation works shall not cause any disturbance to the local activity.

## Testing & Commissioning

The Contractor shall conduct or manage inspections and tests, prepare, and submit documentations to the ICLEI South Asia as per standard processes and procedures set forth in the Contract. The Contractor shall commission the Plant in accordance with the ICLEI South Asia's Requirements and the requirement laid down in this document and the Contract. The Contractor shall commission the Inverter with On-site Manufacturers' Representative.

The Contractor shall perform all works in accordance with the Contract and in a manner so that the works meet the associated requirements of the ICLEI South Asia/SMC and Distribution Utility. The Contractor shall provide all staffs, equipment and materials required to complete the Works, including everything necessary to achieve the agreed Plant Commissioning Date, save the specific requirements which are to be fulfilled by the SMC. The Contractor shall meet all applicable safety and performance standards set out by applicable Laws and Standards.

The Contractor shall maintain all As-Built Drawings on Site for review and shall provide the final set of "As-Built" drawings.

## Interconnection

The Contractor's scope of work shall start from the point of supply of all the solar system equipment and installation, equipment foundations and continue up to the point of interconnection at the WBSIEDCL meter of the building. The grid interconnection arrangement has to be such that the grid-tied SPV project shall remain operational during grid-on hours and battery source shall take over to provide power back-up to the identified load. Supply, installation, testing and commissioning of all systems, equipment, materials etc. within the range of the interconnection Point shall be in the scope of the EPC Contractor.

## O&M

The EPC Contractor shall take full responsibility of comprehensive O&M, starting from CoD for a period of two (2) years. The EPC Contractor shall submit a comprehensive O&M Plan consisting of Plant operation, preventive, corrective and contingency maintenance philosophies. The Contractor shall prepare and submit all Operator's and Owner's training and Plant O&M Manuals.

## Defects Liability

During the Defects Liability Period of 2 years, the Contractor shall execute any work required to remedy Defects in accordance with the Conditions of the Contract. The response time for remedying defects on working days shall be within maximum twenty-four (24) hours from the time of intimation. In case of holidays, the Contractor shall respond on the next working day. Above all, the Contractor must ensure guaranteed hybrid SPV plant availability and performance.



## Plant Performance Guarantee

The Plant Performance Test for Provisional Plant Acceptance will be conducted after commissioning of the Plant. As part of performance guarantee, the Contractor must provide a minimum annual generation guarantee of 1,626 kWh/kWp of specific energy corresponding to annual solar irradiation of 1,770 kWh/m<sup>2</sup>. If the Contractor fails to achieve the minimum guaranteed performance for the plant acceptance, the Contractor shall at its own cost rectify all the defects identified.

The generation estimation shall be weather corrected corresponding to the actual irradiation at the site. The guaranteed generation shall be reduced by 2% for first year and by 1% year on year for subsequent years considering deration of solar modules and other BoS components. The deductions against the bank guarantee during O&M period shall be applicable if the actual generation is below 97% of guaranteed generation for the respective year and deductions will be decided on actual basis. It is to be noted that system downtime due to BoS components and absence of required load will be excluded while estimating the generation guarantee.

## Commissioning

The Plant shall be commissioned means the plant shall be electrically charged and starts supplying solar power. The date on which the Plant is charged electrically and starts supplying power is called date of commissioning or commercial operation date (CoD). The DLP and O&M of the Plant shall start from the CoD.

## Provisional Plant Acceptance Criteria

The Provisional Plant Acceptance Certificate shall be issued by ICLEI South Asia / SMC upon successfully:

1. Achieve mechanical completion;
2. Achieve commissioning of the total project capacity;
3. Achieve minimum guaranteed performance;
4. Clearance of all punch points;
5. Submission of as-built drawings and documents (soft copy of all drawings and documents);
6. Transfer of title to the SMC;
7. Submission of a performance bank guarantee applicable for O&M period; and
8. Submission of O&M plan for SMC's approval.

## Plant Acceptance and Handing Over –Taking Over

The Plant shall be accepted, and the Plant Acceptance Certificate shall be issued by the ICLEI South Asia/ SMC to the Contractor upon successful in meeting guaranteed performance and plant availability during the 2 years of Defects Liability Period. Once Plant Acceptance Certificate is issued, the Plant shall be handed over by the Contractor and taken over by the SMC upon successful completion of all tasks to be performed at Site on equipment supplied, installed, erected, commissioned, and guaranteed performance achieved for 2 years by the Contractor in accordance with provision of the Contract. During handing over of complete Project, the Contractor shall submit the following for considering final payment and release of BG:

1. All as- built drawings and documents as per the contract coordination procedure set out for the successful completion of the Project (two sets of hard copy and a set of soft copy in appropriate format; both pdf and editable file formats).
2. Final Engineering Documents (as-built or detail engineering, whichever is final) with detailed specification, schematic drawing, circuit drawing, cable routing plans and test results, manuals for all deliverable items, Operation, Maintenance and Safety Instruction Manual and other information about the Project.



3. Bill of materials for as-built.
4. Inventory of recommended and mandatory spares and tools and tackles.
5. Clearing dues if any to be paid by the Contractor with respect to applicable penalties, LDs etc.

## Annexure 1: Formats for submission of bid

### A. Sample format for Submission of Price Bid for Hybrid SPV project at Siliguri Municipal Corporation Administrative Building, Siliguri, West Bengal

Name of the bidder			
Components	Per Unit kW Cost (INR)	Total Cost (INR)*	Remarks
<b>Solar PV Modules</b>			
<b>String inverter</b>			
<b>Battery and BMS</b>			
<b>Balance of System Components</b>			
<b>Installation &amp; commissioning</b>			
<b>Approximate Net Metering Application including cost of net meter, application fees, meter testing fees, etc.</b>			
<b>Operation &amp; Maintenance for 2 years</b>			
<b>Soft cost</b>			
<b>Total Tax applicable</b>			
<b>Total Cost Design, Supply, Installation, Testing, Commissioning of 25 kWp hybrid SPV project (Inclusive of O&amp;M cost for 2 years) **</b>			
<b>Total Cost in Words</b>			
<b>Lead time for procurement of</b>			
<ul style="list-style-type: none"> <li>• solar PV modules</li> <li>• inverter</li> <li>• Battery</li> <li>• BoS components</li> </ul>			
*Note- All the rates should be inclusive of all taxes, duties, excise, insurance etc.			
** Scope of work subject to approval by ICLEI South Asia and SMC authority.			