



# TENDER DOCUMENTS

Design, Supply, Installation, Testing and Commissioning along with After Sales Service of 3 Phase Hybrid Solar System for SAARC Secretariat building, Kathmandu, Nepal

**SAARC ENERGY CENTRE**  
697, Street 43, E-11/4, (NPF), Islamabad  
Tel: (+92 51) 2228802 & 4 Fax: (+92 51) 2221937  
[info@saarcenergy.org](mailto:info@saarcenergy.org)

## **Terms & Conditions**

SAARC Energy Centre (SEC) invites sealed tenders for the Design, Supply, Installation, Testing and Commissioning along with After Sales Service of 3 Phase Hybrid Solar System for SAARC Secretariat building in Kathmandu, Nepal with all equipment as per list at page 5-7, on turnkey basis. The price should be mentioned including all accessories, transportation, installation, and other service charges. Other terms and conditions, where applicable, will be as under:

### **I. Closing Date for Submission of Tenders:**

The last date for submission of tenders is 22<sup>nd</sup> March 2019 at 1100 hours. The tenders must be submitted (Hard copy only) by post at the below mentioned address of SAARC Energy Centre office, Islamabad, Pakistan:

**Administrative Officer**

SAARC Energy Centre

House No. 697, Street No. 43, E-11/4, NPF, Islamabad, Pakistan

Tel: (+92 51) 2228802 & 4 Fax: (+92 51) 2221937 email: [info@saarcenergy.org](mailto:info@saarcenergy.org)

### **II. Validity of Tenders/Offers:**

The Tenders/offers for the project shall remain valid for acceptance at least for 60 days from the date of tender closing/opening i.e. 22<sup>nd</sup> March 2019.

### **III. Prices:**

The tenderers/bidders are advised to quote prices/rates of complete project on turnkey basis and quoted prices/rates should be in US Dollars only. The prices should be valid for 60 days and all types of Government Taxes/duties/fees must be shown separately where applicable. The Taxes if applicable and not mentioned in the bid will be borne by the bidder(s).

### **IV. Technical Specifications:**

The technical specifications for Solar PV panels and other items of the complete system are described as per list at page 5-7. The tenderers should not deviate from these technical specifications and should submit complete details of the item(s), technical design of Solar

system and send authentic literature/specifications along with their tenders/offers, traceable to the genuine manufacturers or testing laboratories/institutions.

**V. Delivery/ Installation:**

The complete Hybrid Solar System must be supplied and installed by selected contractor in the SAARC Secretariat building within Three (3) months of the receipt of a firm Work Order. The complete details of the SAARC Secretariat building are given at page 9.

**VI. Warranty:**

The Hybrid Solar system (including Batteries) will be supplied and installed under warranty to the effect that these conform to the quality, make and specifications accepted by SEC. All the equipment should be correctly packed, supplied, installed and must be free from any defect(s) and damages. The satisfactory performance of Hybrid Solar System along with accessories should be guaranteed (warranty) for at least Four (4) years from the date of operation of the Hybrid Solar System (including batteries) without payment of any additional cost by the SEC and any fault or un-serviceability in warranty period shall be rectified/ replaced at the cost of supplier.

**VII. After Sales Service:**

The After Sales Services including remote monitoring (preferred if provided) of the system and maintenance for Hybrid Solar System including batteries must be provided for free during warranty period and the party should also submit a separate Service Level Agreement (SLA) applicable after warranty period in the technical proposal.

**VIII. Installation & Maintenance:**

The satisfactory installation/commissioning of the Hybrid Solar System must be done free of charge by the supplier or his agent at SAARC Secretariat building defined in the Work Order to the satisfaction of SEC. The bidders must have local installation company as partner for the project and the local partner must have a proper workshop for the maintenance/ service support and experience.

**IX. Training of personals:**

The supplier shall be responsible for training of 04 persons of the user for day-to-day handling of the installed system.

**X. Bid Submission Quote:**

The financial proposal should cover Design, Supply, Installation, Testing and Commissioning along with after Sales Service of 3 Phase Hybrid Solar System for SAARC Secretariat building in Kathmandu, Nepal. The technical and financial proposal for project must be submitted separately. The Financial proposal should also include annual cost of service after warrantee period i.e., SLA.

**XI. Payment:**

No mobilization advance will be issued to the selected contractor for the project. The total contracted payment will be released only after successful completion of the project and its subsequent acceptance by SEC.

**XII. Bid/Tender Opening procedure**

- a. The bid for the project must comprise a single package containing two separate envelopes. Each envelope must contain separately the financial proposal and the technical proposal of project;
- b. The envelop shall be marked as “Financial Proposal” and “Technical Proposal” in bold and legible letters;
- c. Initially, only the envelope marked “Technical Proposal” shall be opened;
- d. The envelope marked as “Financial Proposal” shall be retained in the custody of SAARC Energy Centre without being opened;
- e. The technical proposal shall be evaluated in a manner prescribed in the tender documents, without reference to the price and any proposal may be rejected if it does not conform to the specified requirements/specifications;
- f. No amendments/change on technical specifications in the technical proposal shall be permitted and SEC will not accept any conditional proposal. All such proposals will be rejected.

- g. The financial proposals of bids meeting the technical specification after technical evaluations shall be opened publicly at a time, date and venue announced and communicated to the bidders in advance. The financial bids of technically unsuccessful bidders will be returned unopened after technical evaluation.
- h. The Tenders for the project should reach by 1100 hours on 22<sup>nd</sup> March 2019 at the address of SAARC Energy Centre office.

**XIII. Acceptance of Tender(s)/Offer(s):-**

SAARC Energy Centre reserves the right to reject any or all the tenders. Any query or clarification with reference to the tender may be addressed to Mr. Ahsan Javed, Research Fellow (RE) at his email address ([ahsan@saarcenergy.org](mailto:ahsan@saarcenergy.org))

## Technical Specifications

Design, Supply, Installation, Testing and Commissioning along with After Sales Service of 20 kW, 3 Phase Hybrid Solar System for SAARC Secretariat building in Kathmandu as per the following technical specification:

| <u>S. No.</u> | <u>Equipment</u>                      | <u>Description</u>  |
|---------------|---------------------------------------|---|
| 1             | Inverter                              | <p>20 KW inverter(s) (system configuration) with provision for net-metering and battery back-up, should convert DC power produced by SPV modules in to AC power and adjust the voltage &amp; frequency levels to suit the local grid conditions.</p> <p>Pure Sine wave output. Ground Fault Protection. Residual Current Detection (RCD) protection. Monitoring software for real-time status display and fault control. The unit should be able to operate in a high ambient temperature environment. Efficiency must be 96% or above at full load.</p> <p>The inverter must conform to the latest edition of IEC 61727, IEC 61000-6-1, IEC 610006-2, IEC 62109 and IEC 62116 standards.</p>   |
| 2             | Battery Banks (Lithium-ion batteries) | <p>Lithium-ion batteries of approximate capacity of 20kWh with complete battery management system. The following testing information must be provided by the bidders:</p> <ul style="list-style-type: none"> <li>a) Charge/Discharge Efficiency</li> <li>b) Self-Discharge</li> <li>c) Cyclic Performance Report including at least the following parameters: <ul style="list-style-type: none"> <li>i. Ideal Cyclic Performance</li> <li>ii. Practicable Ideal Cyclic Performance</li> <li>iii. Practicable daily Cyclic Performance</li> </ul> </li> </ul> <p>The batteries must conform to the latest edition of IEC 62133 and/or IEC 61960 (whichever is applicable). The battery bank should provide backup to a critical load of 10 kW.</p>   |
| 3             | Solar PV Panels                       | <p>20 KW of Solar PV Crystalline Silicon (poly-crystalline silicon) Panels (PV Cells of USA/Canada/Japan/Germany or Equivalent) of A-class, only tier-1 as per the latest Bloomberg listing, with 10 years manufacturing Warranty and 25 year linear performance warranty. The actual annual power decline should be no more than 0.7%. By the end of year 25, the actual power output should be no less than 80% of the labeled power output. The Panels should have more than 0.75 fill factor. The following information about the PV Panels and its Solar Cells may be provided:</p> <ul style="list-style-type: none"> <li>a) Name of the manufacturer of PV Module</li> <li>b) Name of the Manufacturer of Solar cells</li> <li>c) Month and year of the manufacture (separately for cells and module)</li> <li>d) Country of origin (separately for solar cells and module)</li> <li>e) I-V curve for the module</li> <li>f) Peak Wattage, <math>I_m</math>, <math>V_m</math> and FF for the module</li> <li>g) Unique Serial No and Model No of the module</li> <li>h) Date and year of obtaining IEC PV module qualification certificate</li> <li>i) Name of the test lab issuing IEC certificate</li> <li>j) Other relevant information on traceability of solar cells and module as</li> </ul> |

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|---|--------------------|---|
|   |                    | <p>per ISO 9000 series including manufacturing details of the panels such as glass superstrate, encapsulant, backsheet, junction box, cables and connectors.</p> <p>The PV modules must conform to the latest edition of IEC 61215 Standard for PV module design qualification and type approval; and IEC 61230 standard for earthing and short circuiting; and IEC 61730 standard for safety qualification. A certificate and a report stating compliance to the relevant standards which is also verifiable from the certifying laboratory shall be submitted.</p>  |
| 4 | Battery Racks      | Aesthetically pleasing and mechanically strong battery racks which can bear a load of min 100kg /rack to be provided.   |
| 5 | Power Cables       | <p>Power cables with appropriate size used in the Hybrid Solar System must have the following characteristics:</p> <ol style="list-style-type: none"> <li>a) Must conform to latest edition of IEC 60227 and IEC 60502 standards.</li> <li>b) Temperature Range should be -10°C to +80°C.</li> <li>c) Excellent resistance to heat, cold, water, oil, abrasion and UV radiation.</li> <li>d) Sizes of cables between array interconnections (6 mm<sup>2</sup> min.), array to junction boxes (6 mm<sup>2</sup> min.), junction boxes to Inverter (6 mm<sup>2</sup> min.), inverter to batteries (25 mm<sup>2</sup> min.) etc. shall be so selected to keep the voltage drop (power loss) of the hybrid solar system to below 1.5%.</li> <li>e) Cables must be compatible to 25 years life of the Hybrid Solar system</li> <li>a) Any separate and/or necessary change in electrical wiring for connecting critical load with Solar PV shall be the responsibility of selected bidder.</li> <li>f) All cable schedules/layout drawings shall be approved prior to installation.</li> <li>g) The Following test reports must be submitted: <ol style="list-style-type: none"> <li>I. Copper purity test (at least 99.9% pure)</li> <li>II. Insulation Thickness Test</li> <li>III. DC Resistance Test</li> <li>IV. High Voltage Test</li> </ol> </li> </ol> |
| 6 | Mounting Structure | <p>Galvanized Mild Steel Mounting Structures may be used for mounting the PV Panels. The following instructions/guidelines must be followed:</p> <ol style="list-style-type: none"> <li>a) The mounting structure should have angle of inclination as per the site conditions to take maximum solar insolation.</li> <li>b) The mounting structure shall be designed to withstand the speed for the wind zone of the location where Solar PV system will be installed.</li> <li>c) The mounting Structure material must be corrosion resistant and electrolytically compatible with the materials used in the module frame, its fasteners, nuts and bolts.</li> <li>d) The total load of the structure (when installed with PV modules) on the roof should be less than 60 kg/m<sup>2</sup>.</li> </ol>   |
| 7 | System accessories | <p>The accessories of Hybrid Solar System must follow the below mentioned instructions/guidelines:</p> <ol style="list-style-type: none"> <li>b) All switches, circuit breakers, and connectors should conform to IEC standard 60947 part I, II, III and IEC standard 60898-1:2015</li> <li>c) The changeover switches and cabling work should be undertaken by the bidder as part of the project</li> <li>d) The junction boxes are to be provided in the PV array for termination of connecting cables.</li> </ol>  |

|    |               |  |
|----|---------------|--|
|    |               | <p>e) The junction boxes shall be made of material with full dust, water &amp; vermin proof arrangement.</p> <p>f) The junction boxes shall be such that input &amp; output terminations are made through suitable cable glands.</p> <p>g) All wires/cables must be terminated through cable lugs.</p> <p>h) Copper bus bars/terminal blocks housed in the junction box with suitable termination threads</p> <p>i) Junction Box of hinged door with EPDM rubber gasket to prevent water entry.</p> <p>j) Provision of suitable earthing in junction box.</p> <p>k) The Hybrid solar system should be provided with all necessary protections like earthing (Both AC &amp; DC), Lightning and anti-islanding.</p> <p>l) Earth resistance shall be tested in presence of SEC and shouldn't be more than 5 ohms</p> <p>m) The Instructions/ Operating manual(s) for the equipment-supplied is/are also to be provided free of charge along with the equipment supply.</p> <p>n) All the outdoor wires/cables of the Solar System shall be properly housed in conduit pipes (preferably High-Density Polyethylene pipes) which offer considerable strength, durability and UV resistance for 25 years project life.</p> |
| 8  | Site services | <p>Net-Metering of the roof top solar PV system for SAARC Secretariat building in Kathmandu would be the responsibility of the selected contractor in accordance with the prevailing regulations/laws of local electrical utility and/or electricity regulator. This also includes payment of any tax/fees/duty for acquiring net-metering license/permission. The incorporation of Battery backup with the overall electrical system of the selected building will be the responsibility of the selected contractor.</p>  |
| 9  | Commissioning | <p>The contractor must perform and show results for following Tests, on site:</p> <p>a) Earthing Test</p> <p>b) Successful Synchronization test with the grid &amp; the generator.</p> <p>c) On-Grid, Off-Grid system test</p> <p>Note: Testing Equipment including Earthing Tester etc. will be supplier's responsibility. Earthing (if required) shall be the responsibility of the supplier.</p>  |
| 10 | System Life   | <p>The design of the Solar system and provided equipment should have a life of at least 25 years. The quality of the installed equipment should correspond accordingly.</p>  |



## Technical Evaluation Criteria

| <b>Item of description</b>   | <b>Mandatory /Minimum prerequisite</b>  |
|--|---|
| <b>Experience</b><br>Supplier Profile & Past Experience                  | Provide complete profile for following:<br>a) Company expertise<br>b) Expertise in the field of solar PV<br>c) List of major executed projects in last two years  |
| <b>Technical approach</b><br>Specifications and Data Sheets attached     | Provide the following documents of the proposed equipment:<br>a) Specifications and OEM certificates<br>b) Required IEC certifications and test reports<br>c) A written project execution plan<br>d) A written Project Quality Plan<br>e) Drawings of provided equipment (Battery racks, Solar Panel Structure) |
| <b>Staff/Personal</b><br>Certificate of training for system installation | a) Firm must have at least five Engineers with one Engineer (professional) trained in solar energy.<br>b) Engineer with Net-Metering training Certificate (if any)  |
| <b>Details of Local Partner</b><br>(Kabul and Dhaka)                     | Project execution must be done by selected contractor through local partners in Kathmandu only. The following information about local partners may be provided:<br>a) Name and Address<br>b) Projects undertaken<br>c) List of Staff<br>d) Financial strength<br>e) Litigation/blacklisting history             |
| <b>Registration</b>  | Firms must be on list of active Tax Payers and GST in their country of origin (Submit tax registration certificates)  |
| <b>Financial Strength</b>  | Average annual turnover   |
| <b>Authorized Dealership</b>   | Firm must attach the certificates for authorized dealership of major products i.e. PV Modules, Inverters, Batteries.  |
| <b>Litigation/Blacklisting History</b>                                   | Firm must furnish an affidavit of Non-blacklisting and No litigation with any Govt./ Non-Govt. organization in their country of origin.   |

## Description of project location in SAARC Secretariat building, Nepal

**Name and address:** SAARC Secretariat, Tridevi Sadak, G.P.O. Box 4222, Kathmandu, Nepal

**Contact Details:** (+977 1) 4221785, 4226350, 4231334

**GPS Coordinates:** 27.7135 N, 85.3145 E

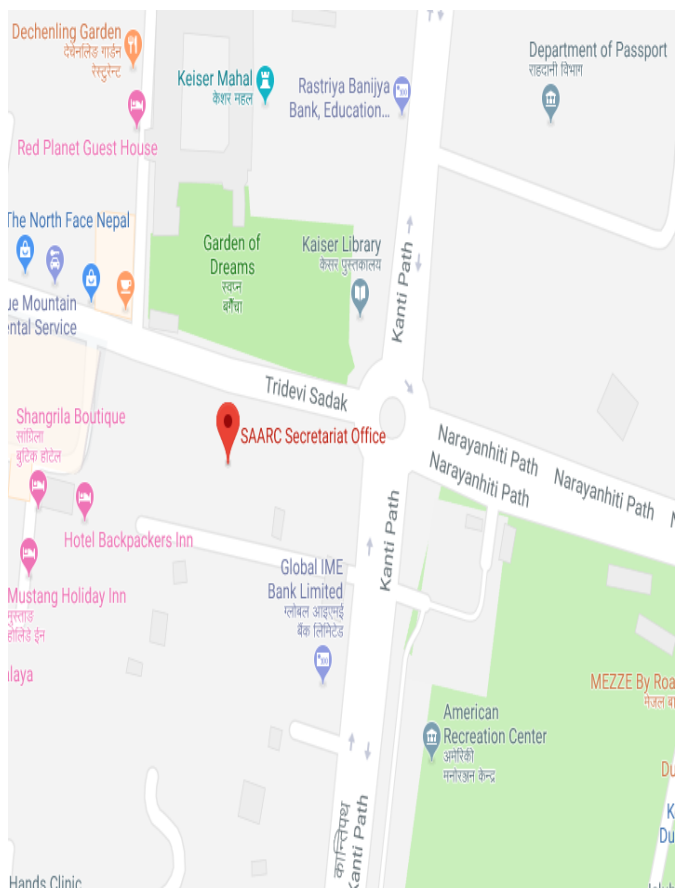
**Area of roof-top:** Approx. 4000 ft<sup>2</sup> (Length 80 feet, Width 50 feet)

**Critical load:** Approx. 5-6 kW

**Total Backup time:** 1 - 1.5 hours

**Roof-top type:** Rooftop is cemented with no shadow of surroundings

**Backup Generator:** Already installed (100 kVA)



Google map location



Photo of Roof-top