

**TERMS OF REFERENCE (TORS) FOR
MONITORING AND EVALUATION CONSULTANCY FIRM FOR THE HIRING OF
SHORT-TERM MONITORING AND EVALUATION CONSULTANCY FIRM FOR
THE PROJECT TITLED “INSTALLATION OF SOLAR SYSTEM AT MULTIPLE
SITES UNDER DIFFERENT PROJECTS IN PUNJAB”
(PUNJAB ASSEMBLY AND ALLIED BUILDINGS)**

1. INTRODUCTION / BRIEF BACKGROUND

PEECA shall hire Monitoring & Evaluation Consultant/s firm (duly registered with Pakistan Engineering Council) to assist in implementation of the project to the specific standards, completed on schedule, ensure a proper monitoring of the results and with no cost overrun. The Consultant will also provide advisory and capacity development for project implementation and for the operation and maintenance of the system introduced under the project.

2. OBJECTIVES

The Consultant’s responsibilities include the following (but not only limited to):

1. Assist Client in contract management for the Developer standard engineering Design, Supply, Installation and Commissioning (DSI&C) contracts, including but not limited to issuing variation orders to the Developer contracts, reviewing and approving contractor risk management plan, project quality assurance and quality control plan, Health, Safety and Environment Plan etc.
2. Certify all payments to the Developer contractors.
3. Control cost, quality and schedule of contractor’s works as per deliverables.
4. On behalf of the Client, inspect and accept goods and services related to the project.
5. Recommend appropriate mitigation actions (as defined in DSI&C contract) when quality of deliverables does not meet the specifications.
6. Define and ensure that implementation by the Contractors of an installation safety process manual that follows local regulations, standards and best practices as per internationally acceptable standards (IEEE, IEC) etc.
7. Define and ensure the proper implementation by the Contractor of the O&M manual.
8. Define and ensure that all local technical, legal, regulatory and financial requirements are met in all aspects of the project including but not limited to procurement of goods, payments to the contractors etc.
9. Assist the client in ensuring that all social and environmental provisions are met as per the local regulations in place.
10. Efficient/Professional analysis, appraisal, examination, vetting of the project concept/design implementation including supply & installation of appliances and other technical aspects as per the scope of work.
11. Monitor and review of quantities and qualities of equipment’s at all the sites.
12. To certify that all contractual obligations and procedural formalities have been completed in all respects for the implementation of the project as per the scope of works.
13. Arrangement of the testing sample comprising of 1% of equipment specified by the client.

3. SCOPE OF WORKS

The consultancy will encompass the following tasks:

STEP-I

Site Inspection

The Consultant will visit and take an overview of the site to get familiar with the Client's requirement. The consulting firm shall collect all the relevant data for client, beneficiary office and DISCOs essential to carry out project activities.

STEP-II

Review of Design / Drawings, Quality Assurance/Post-Shipment Inspection

The Consulting Firm will exercise due diligence in performing their services aimed at achieving economical,

quality assurance and sound implementation of the Project. After the award of Contract, a team shall be organized, to ensure the availability of the highest level of expertise for project management, supervision of design and site supervision during installation of the Project. For day-to-day contact and effective liaison with the Client and proper project handling, the Consulting Firm will designate a Project Manager. The Project Manager will be having extensive related experience; he will be the contact point for any senior level interface with the Client and will also coordinate with the team of the Consulting Firm and Contractor for proper and timely completion of the project.

a) Review of Design / Drawings

The Consulting Firm will examine and approve Contractor's drawings, documents and other information prepared for the execution of the Project to ensure:

- Compliance with the Contract and Specifications
- Adherence to the applicable Codes and Standards

And will review all documents defining and describing the major equipment and works for the entire Project with regard to:

- Technical acceptability and completeness
- Functional, operational and safety requirements - Reliability and ease of maintenance Visual Inspection of components
- Supervision of Lab tests of components
- Submission of consolidated report

STEP-III

Installation Supervision

- Site supervision services will cover:
- Supervision during installation of M&E Equipment and civil structure
- Supervision of commissioning and performance of test

STEP-IV

Post Installation Supervision

After the System Installation, performance and operation of the system will be inspected by the consultant firm in an organized manner.

Detailed steps are discussed below:

Field Inspection

After the preliminary inspection a detailed inspection of all the system components will be carried out including PV panels, inverter, combiner boxes and cabling. Also system data logging will be properly checked.

Field Inspection of System

The field inspection will include the following steps:

- a) The consulting firm will check that PV modules are physically installed as per plans (number and layout) and also get support of modern computer tools and simulations for azimuth and panel structure design/directions.
- b) Trees and plants will not grow tall enough to shade array and affect its energy yield
- c) The consultants will check that the lands are secure.
- d) String fuses or circuit breakers are DC-rated and not larger than module fuse rating
- e) The consultants will check that the modules are in good condition i.e. not broken glass or cells, no discoloration, frames are not damaged.
- f) Module connectors should be tight and secure
- g) Wire and conduit sizes installed per order
- h) Wiring is installed with shortest distance from PV panels to inverter
- i) Wiring is neat and secure
- j) Wiring is not readily accessible
- k) Conduit/channels supported properly
- l) No potential damage to wire through equipment or other is permissible
- m) PV module frame are properly grounded with dedicated grounding conductor
- n) Proper grounding of all other metallic surfaces that might possibly become energized (conduit, combiner boxes, disconnect enclosures, etc.)
- o) Dissimilar metals are electrically isolated to avoid galvanic corrosion
- p) Aluminum is not placed in direct contact with iron or other metal.
- q) All mounting structures/frames and metallic components, nuts and bolts may be galvanized
- r) In addition, wiring, piping, conduit, fixtures, junction boxes, distribution boxes and related accessories should be IEC standards compliant
- s) Effective washing system should be installed

o Field Inspection for System Labelling

- a) All equipment and parts are labelled as required as per engineering diagram provided by the vendor
- b) Breakers are properly labelled
- c) Wires are properly labelled
- d) Outdoor labels are designed to withstand as per external environment
- e) Wiring diagram may be furnished on the distribution board

4. ROLE OF THE CLIENT

- The Client shall cooperate with the M&E Consultant and shall be obliged to provide the information/documents necessary to provide the services.
- The Client shall ensure that, where cooperation is required from, or decisions need to be taken or approvals given by the Client during the period of this Agreement that cooperation will be promptly given and these decisions or approvals will not be unreasonably withheld or delayed.

5. DURATION OF THE ASSIGNMENT

The duration of the assignment of consultant firm is linked with contractor's deliverables.

6. DELIVERABLES

Payment (s) for the M & E Consultant shall be triggered pursuant to the validation and verification of each deliverable submitted by the Contractor.

Sr #	Payment Milestones/ Deliverables	Percentage (%) of the contract value	Total
1	On Verification and validation of Survey & Design Approval	5%	
2	On Verification and validation of Site Preparation (Clearance of Roof, Civil work for PV Mounting Structure,)	10%	
3	On Verification and validation of Supply and Installation of PV Mounting Structure	10%	
4	On Verification and validation of Supply of Solar Modules at Site and Submission of approved Sample Test Reports	15%	
5	On Verification and validation of Supply of Inverter along with AC Cables, DC Cables, Earthing and allied accessories	10%	
6	On Verification and validation of Installation of Solar Module at site	15%	
7	On Verification and validation of Installation of invertors cabling, earthing equipment and allied accessories	15%	
8	On Verification and validation of Complete installation commissioning of Solar system	5%	
9	On Verification and validation of Upon installation of Bi-Directional Meter, Submission of Net Metering Application of site to DISCO as per NEPRA	5%	

10	On Verification and validation of Rectification of Punch List and Training of Designated Official (s) of for Operation and Maintenance (O & M)	5%	
11	On Verification and validation of Submission of Final Report after successful completion of the Project and upon submission of Performance Security against O&M.	5%	
		100%	

Note: Payment terms may vary at the time of signing of a contract with the mutual consent of both parties.

7. QUALIFICATION AND EXPERIENCE OF THE FIRM

The consultancy firm should provide the following details

i. Mandatory Requirements for consultancy Firm:

- Registration with NTN
- Registration with PRA
- Registration with PEC
- Provide non-blacklisting undertaking on letter head/ Non-Judicial Affidavit
- Provide evidences of work experience M & E/ TPV nature

ii. Team with following qualification and experience:

SR NO	KEY STAFF	AREA OF SPECIFIC EXPERTISE DESIRED	NUMBER OF PERSONNEL	EXPERIENCE
1.	Project Manager	Overall management assignment	01	At least Graduate Mechatronic-Electrical Engineer, with minimum 10 years' experience in relevant field. Must have worked at executive position in public or private sector organizations and fully conversant with the power sector procedures and laws in Pakistan /Punjab. Experience for Optimizing execution and operational costs during implementation phase of the project.
2.	Solar Expert	Technical Expertise	02	At least Graduate Mechatronics/ Electrical Engineer with minimum 8 years' experience of solar power plants, preferably PV plants & water Pumping. Experience in development of BOQ for execution of solar projects, Preparation/review of design/drawings, Conducting post installation testing & commissioning of the solar systems, Post-shipment inspection of the solar equipment, Application of quality assurance / cartrol protocols.

3.	Electrical Engineer	Design/operation of solar panels, charge controller, inverters. transformers etc.	01	At least Graduate Electrical Engineer with minimum 5 year experience in the relevant fields with experience in de-sign, installation, inspection and commissioning of Solar PV plants
4.	Civil Engineer (Civil Structure)	Mounting structure for PV panels etc.	01	At least Graduate Civil Engineer with minimum 5 years' experience in the relevant fields with experience in design. installation, inspection and commissioning

8. PROFESSIONAL LIABILITY OF CONSULTANT:

The professional liability of the consultant shall be as defined in Rule 54 of the Punjab Procurement Rules,2014 (amended till date).