Request for Proposals

RFP-USAID POWER CENTRAL ASIA ACTIVITY-2024-005

**Activity Title: Design, procurement, installation, commissioning and training for 73 kW on-grid system on the roof of the Ministry of Energy and Water Resources building, Dushanbe, Tajikistan**

Issuance Date: October 16, 2024, at 18:00 HR (Dushanbe time)

Deadline for Receipt of Questions: October 24, 2024, at 18:00 HR (Dushanbe time)

Closing Date and Time: October 30, 2024 at 18:00 HR (Dushanbe Time)

*Issuance of this RFP does not constitute an award commitment on the Tetra Tech ES, Inc., nor does it commit to pay for any costs incurred in preparation or submission of comments/suggestions of a proposal. Proposals are submitted at the risk of the bidders. All preparation and submission costs are at the bidder’s expense.*

**Table of Contents**

[1. INTRODUCTION 3](#_Toc109918188)

[2. BIDDER’S QUALIFICATIONS 3](#_Toc109918189)

[3. SOURCE AND NATIONALITY RESTRICTIONS 4](#_Toc109918190)

[4. SUBMISSION OF PROPOSALS 4](#_Toc109918191)

[5. QUESTIONS AND CLARIFICATIONS 4](#_Toc109918192)

[6. PROPOSALS PREPARATION INSTRUCTIONS 4](#_Toc109918193)

[7. EVALUATION CRITERIA 6](#_Toc109918194)

[8. TERMS OF PAYMENT 7](#_Toc109918195)

[9. SAM.GOV UNIQUE ENTITY IDENTIFIER REGISTRATION 7](#_Toc109918196)

[10. NEGOTIATIONS 8](#_Toc109918197)

[11. MULTIPLE/PARTIAL/NO AWARD 8](#_Toc109918198)

[ATTACHMENT A – TECHNICAL SPECIFICATION 9](#_Toc109918199)

[ATTACHMENT B – DETAILED BUDGET 20](#_Toc109918200)

[ATTACHMENT C – REPRESENTATIONS AND CERTIFICATIONS 21](#_Toc109918201)

1. INTRODUCTION

The purpose of this Request for Proposal (RFP) is to advance the regional electricity market in Central Asia through the “Design, procurement, installation, commissioning, and training for 73 kW on-grid system *on the roof of the Ministry of Energy and Water Resources building in Dushanbe, Tajikistan,* as outlined within the Scope of Work (SOW) specified in the Attachment A – Technical Specification for the United States Agency for International Development (USAID) Power Central Asia Activity (Project), funded by USAID and implemented by Tetra Tech ES, Inc. (Tetra Tech). Tetra Tech has been implementing this Project since October 2020. This Project designed to assist the five Central Asian countries—Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan—to meet their national energy priorities, reap economic benefits from cross-border energy trading, and improve their energy security through greater regional connectivity. Under this Project, Tetra Tech has been providing technical support to national governments, utilities, and other stakeholders to transform domestic energy markets, strengthen the regional electricity market, and promote greater adoption of clean energy technologies.

1. BIDDER’S QUALIFICATIONS

Bidder must provide the following information and references to be qualified for the procurement process:

1. Company’s information, including official registered title, type of business, address, and contact person information.
2. A short description of the company and of past similar experience in providing the services described in the Attachment A -Technical Specification.
3. Overall technical approach and methodology to fulfill the specifications defined in Attachment A – Technical Specifications.
4. Certification that company is not owned or controlled in total or in part by any entity of any government or receiving any direct or indirect financial, in-kind or other subsidies from the public sector (collectively defined as Government Owned Entity or GoE).
5. Certification by any subcontractor engaged by the company for this project that the subcontractor is not a GoE.
6. The Bidder shall complete and sign the Representation and Certifications found in Attachment C to this document and include them with the Bidder’s proposal. Proposals that do not include these certifications will not be considered.
7. Bidder can submit proposal as a consortium of several companies or organizations from Tajikistan or other foreign countries. The foreign partners must be within the geographic code 937 or 110, as defined by USAID. The prime offeror will be responsible for the main contract and deliverables.
8. At least five (5) years of high-level relevant experience with verifiable practical experience and should be financially stable, with a relevant and successful industry track record with reputable institutions around the world.
9. Experience working with the U.S. Government funded projects is preferred but not a requirement.
10. Information about the Bidder’s past or current experience in providing services similar to those outlined in the SOW.
11. SOURCE AND NATIONALITY RESTRICTIONS

The USAID authorized geographic code for this Project is 937, encompassing the United States, the recipient country, and developing countries excluding advanced developing countries, with the exception of any country classified as a prohibited source. Additionally, the geographic code 110 applies. It is important to note that Bidders must be located within the authorized geographic code and not be classified as a prohibited source to be considered for participation in this procurement. Prohibited sources, as outlined by the U.S. Department of the Treasury's Office of Foreign Assets Control (OFAC), include countries such as Russian Federation, Iran, North Korea, Cuba, Afghanistan, Iraq, the Balkans, Belarus, Burma, Yemen, Syria, Ethiopia, Zimbabwe, Somalia, South Sudan, Nicaragua, People’s Republic of China, and Hong Kong. Compliance with these requirements will be verified by the Contracting Officer. Local procurements should adhere to AIDAR 752.225-71 and ADS 311, while detailed source and nationality rules can be found in USAID regulation ADS 310, accessible at the following link: <https://www.usaid.gov/about-us/agency-policy/series-300/310> Failure to comply with these provisions may lead to disqualification from consideration for award.

Note: Bidders not from the afore-referenced Geographic Code countries should reach out to Tetra Tech before committing to an offer at [pcabids@tetratech.com](mailto:pcabids@tetratech.com) Offers not in compliance with the geographic code without prior written approval may result in disqualification of the bidder from consideration for award.

1. SUBMISSION OF PROPOSALS

**All proposals are due on October 30, 2024,** by no later than 06PM local time in Dushanbe, Tajikistan. Proposals must be submitted via e-mail at the address [pcabids@tetratech.com](mailto:pcabids@tetratech.com) in the following formats: Adobe Acrobat and Microsoft Word and/or Excel.

All proposals must fully respond to the Technical Specifications enclosed as Attachment A; and must include quotes in the format provided in the Attachment B - Table 1 – Budget. Proposals received after the above-stated due date and time will not be considered for this procurement.

By submitting a proposal, bidders acknowledge their understanding and acceptance of all procurement requirements outlined in this RFP, including the geographic code requirements.

1. QUESTIONS AND CLARIFICATIONS

**All questions or clarifications** regarding this RFP must be in writing and submitted, **in English, to** [pcabids@tetratech.com](mailto:pcabids@tetratech.com) **on October 24, 2024, no later than 06PM** local time in Dushanbe, Tajikistan. Questions and requests for clarification, and the responses thereto, will be circulated to all RFP recipients.

Only written answers from Tetra Tech will be considered official and carry weight in the RFP process and subsequent evaluation. Any answers received outside the official channel, whether received verbally or in writing, from employees or representatives of Tetra Tech, or any other party, will not be considered official responses regarding this RFP.

1. PROPOSALS PREPARATION INSTRUCTIONS

Bidder must follow the instructions set forth herein to be qualified for the procurement process. If Bidder does not follow the instructions set forth herein, the Bidder’s proposal may be eliminated from further consideration or the proposal may be downgraded and not receive full credit under the applicable evaluation criteria.

Separate Technical and Price Proposals must be submitted. All proposals should be submitted in English.

*Technical Proposal*

The technical proposal (excluding CVs) shall not exceed 10 pages. Proposals will be scored on a 100-point scale. Available points for each evaluation factor are given below. Bidder must address each evaluation factor. The evaluation criteria details can be found on Section 7 below.

The suggested outline for the technical proposal is stated below:

1. **Organization’s Information**
   1. Organization’s information, including official registered title, type of business, list of offices if applicable, address, telephone, fax and website.
   2. Organization’s Unique Entity Identifier (UEI) number (if an organization does not have UEI number, confirm your commitment to obtain it within 30 days of the proposal submission).
   3. Authorized point of contact with phone number(s) and email address.
2. **Company Technical Capability**

Description of organization, including examples of similar activities/qualifications as requested in the SOW. Demonstrate capacity in implementation of the SOW.

1. **Technical Approach**

Present a narrative that describes how the Bidder plans to implement the tasks identified in the scope of work. This narrative must also include:

1. A management approach which describes how the Bidder will manage the delivery of the services and how the Bidder will interact with USAID Power Central Asia Activity.
2. A draft work plan that outlines the proposed activities over the course of the period of performance. All products and services proposed must be compliant and consistent to the RFP’s authorized geographic code and US and international standards.

Information which the Bidder considers proprietary, if any, should be clearly marked “proprietary” next to the relevant part of the text and it will then be treated as such.

1. **Company Past Performance**

Bidder shall provide a summary of relevant studies and assignments including the title of the assignment, client name, date and a brief description. The qualifications section is limited to five (5) of the most relevant studies or other assignments performed in the last five (5) years, presented in the following table format. If the client is confidential, simply list “confidential.”

|  |  |  |  |
| --- | --- | --- | --- |
| **Title of Assignment** | **Description of the assignment and services provided** | **Client Name** | **Dates of Execution** |
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*Financial Proposal*

1. **Price Proposal**

Bidder shall provide a firm-fixed-price (FFP) financial proposal **in USD**. Bidder shall provide their most competitive best and final financial offer. The Project’s estimated budget for this project is not higher than US$80,000.00 including all applicable VAT and taxes (on turn-key basis).

Tetra Tech reserves the right to request additional cost information if the evaluation committee has concerns about price reasonableness, realism, or completeness of the Bidder’s proposal.

Prices quoted should be valid for 60 calendar days counted from the next day of the **Closing Date and Time** and must clearly separate taxes, duties, insurances, other costs, taxes, and the VAT, as applicable.

The Bidder shall complete **Table 1 of the Attachment B “Detailed Budget”** to allow Tetra Tech to compare all quotes and make a competitive selection. The budget shall be provided in Excel format with unlocked cells and must not include hidden formulas or tabs, or linkages to external files or data sources.

A price must be provided for each project component to be considered compliant with this request. The price proposal shall include the individual line items shown in the template, e.g., fully burdened daily rates, travel costs, and other direct costs. Offers must show unit prices, quantities, and total price. All items and services must be clearly labeled and included in the total offered price. The price proposal shall also include a budget narrative that explains the basis for the estimate of every cost element or line item. Supporting information must be provided in sufficient detail to allow for a complete analysis of each cost element or line item. **Tetra Tech reserves the right to request additional cost information if the evaluation committee has concerns about the reasonableness, realism, or completeness of Bidder’s proposed price.**

1. **Proposed Billing Rates Certification**

On company letterhead, certify the labor rates being proposed are standard rates and have been previously billed to clients for similar work.

1. **Representations and Certifications**

These documents can be found in Attachments C of this RFP and must be submitted as part of the Cost Proposal.

Under no circumstances shall cost information or any prices, whether for deliverables or line items be included in the technical proposal. Cost information shall only be shown in the cost proposal.

1. EVALUATION CRITERIA

Award will be made to the bidder representing the best value in consideration of past performance, qualifications, and price factors. Technical criteria are more important than cost, although prices must be reasonable and will be considered in the evaluation. Bidders are encouraged to provide a discount to their standard commercial rates.

Tetra Tech reserves the right to conduct discussions with selected bidder(s) to identify the best value offer. Award of any resulting Subcontract Agreement shall be made by Tetra Tech on a best value basis.

The submitted proposal will be scored by an evaluation committee using the criteria: (a) technical proposal (60 points), and (b) price proposal (40 points).

Given the specific expertise required to perform the services, only bids with a minimum technical score of 45 points or more will be considered for evaluation of their cost proposals.

Proposals will be scored on a 100-point scale. Available points for each evaluation factor are given below.

Technical Proposal *(60 points)*

|  |  |
| --- | --- |
| **Evaluation Criteria for Technical Proposal** | **Points** |
| 1. **Technical Approach** | 15 |
| 1. **Management Plan** | 15 |
| 1. **Organizational Past Experience** | 15 |
| 1. **Personnel** | 15 |
| **TOTAL** | **60** |

Financial Proposal *(40 points).*

The lowest qualified financial proposal will receive the maximum score of 40 points.

The other proposals will be scored inversely proportional to their price and computed as follows:

* Sf = 40 \* Fm/F
* Sf = Financial Score of the proposal evaluated
* Fm = the price of the lowest priced Financial Proposal among those qualified
* F = is the price of the Financial Proposal under consideration

Bidder shall submit a Detailed Budget reflecting the price for completing the scope. Bidder shall complete Attachment B – Detailed Budget. Labor rates quoted in this document shall be fully burdened inclusive of all indirect costs, taxes and fee, if any.

Tetra Tech reserves the right to conduct discussions with selected bidder(s) to identify the best value offer. Award of any resulting Subcontract Agreement shall be made by Tetra Tech on a best value basis, with evaluation of proposed price as well as proposed services and implementation schedule.

1. TERMS OF PAYMENT

Payment terms for the awarded Subcontract Agreement shall be net thirty (30) days after satisfactory completion and acceptance of services and deliverables. Payment shall be made by Tetra Tech via bank wire transfer. No advance payments will be provided. Tetra Tech reserves the right to delay invoice approval or payment or deduct amounts equivalent to additional time and resources Tetra Tech may have to deploy to make Consultant’s deliverables acceptable for distribution to USAID, country counterparts or other stakeholders.

1. SAM.GOV UNIQUE ENTITY IDENTIFIER REGISTRATION

If the proposed fixed price is above $30,000, the successful bidder will be required to furnish a SAM Unique Entity Identifier (UEI) number and proof of SAM.gov registration prior to award. Information regarding obtaining a [UEI](file:///C:\Users\gurcharan.gill\AppData\Local\Microsoft\Users\sarvat.maharramli\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\5S49MCRY\UEI) number may be found here: <https://sam.gov/content/duns-uei>

1. NEGOTIATIONS

Best offer proposals are requested. It is anticipated that a subcontract will be awarded solely based on the original offers received. However, Tetra Tech reserves the right to conduct discussions, negotiations and/or request clarifications prior to awarding a subcontract. Furthermore, Tetra Tech reserves the right to conduct a competitive range and to limit the number of bidders in the competitive range to permit an efficient evaluation environment among the most highly rated proposals. Highest-rated bidders, as determined by the technical evaluation committee, may be asked to submit their best prices or technical responses during a competitive range.

1. MULTIPLE/PARTIAL/NO AWARD

Tetra Tech reserves the right to issue multiple awards. Tetra Tech also reserves the right to issue partial or no awards.

ATTACHMENT A – TECHNICAL SPECIFICATION

**SCOPE OF WORK: Design, procurement, installation, commissioning, and training for 73 kW on-grid system on the roof of the Ministry of Energy and Water Resources building in Dushanbe, Tajikistan**

**PERIOD OF PERFORMANCE: 6 months, from December 1, 2024 – May 31, 2025**

**PLACE OF DELIVERY: Dushanbe, Tajikistan**

1. **Introduction**

The United States Agency for International Development (USAID) Power Central Asia Activity (“Project”) is supporting the five Central Asian countries (Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan) to meet their national clean energy goals and regional energy priorities to ensure energy security and to gain economic benefits from regional electricity trade. The over-arching purpose of the Project is to enhance the performance of the national power sectors, increase the role of clean energy, and create a regional electricity market. The Project has three objectives:

• Objective 1: National Market Liberalization Reforms

• Objective 2: Clean Energy

• Objective 3: Regional Power Market

1. **Objective**

A Subcontractor shall provide a total “ready-to-build” project including all necessary equipment, materials, survey, design, engineering, and procurement services to prepare for the installation of 73 kW on-grid Rooftop Solar (RTS) PV System on the roof of **the Ministry of Energy and Water Resources (MEWR) building in Dushanbe, Tajikistan**.

Initial assessment of the roof technical conditions demonstrated the need for roof enforcement. It was agreed that these works will be funded and executed by beneficiary MEWR. All the activities related to development of RTS design, procurement, installation and commissioning should be started only after roof enforcement completed and accepted by certified authorized entity.

The Subcontractor should prepare a system summary detailing each system, applicable equipment, and predicted system energy production (kWh/year). The Subcontractor is responsible for all permitting and licenses and should include the cost of all permitting in their proposal. Respondents should be familiar with building codes, utility regulations, and provide project financial analysis. Tetra Tech reserves the right to modify the scope of the project at any time.

The Subcontractor shall include design documents for all elements of the project, including, but not limited to, structural, architectural, mechanical, and electrical analysis. The contractor shall include specifications, calculations, and drawings in the design package and submit it to Tetra Tech for review and approval. Proposer should consider the following guidelines when designing the solar PV system.

**Design Guidelines for Rooftop PV.**

A Subcontractor shall develop a design for a new PV system at MEWR’s building. The following are the general guidelines to follow during the design and procurement of the PV system:

* The mounting system shall minimize roof penetrations and may include building-integrated roof PV or fully ballasted. The number and size of the penetrations necessary to extend the power and control cable into the building must be kept to a minimum and grouped in a single location when practicable. The mounting system design needs to meet applicable local building code requirements with respect to snow, wind, and earthquake factors.
* Panel installation design shall allow for the best ventilation possible of panels to avoid adverse performance impacts.
* Conduit penetrations shall be minimized.
* A safety zone from the roof edge to the PV system shall be maintained. A clear path of travel shall be maintained to and around all rooftop equipment. Design shall address access for maintenance and replacement of the equipment. Appropriate fall protection or temporary platforms shall be incorporated into the design to allow for this maintenance and replacement work.
* Regarding civil structures the bidder need to take care of the load bearing capacity of the roof and need arrange suitable structures based on the quality of roof.
* The proposed PV systems shall provide lightning, surge, earthing, and grid islanding protection on all electrical systems.
* The system shall be fixed-tilt, with an orientation and tilt that maximizes annual energy production, and on the same maximum power point tracking (MPPT) system.
* The design of the system must ensure the proper access and use of the roof area for PV systems’ maintenance work.
* The installation and power generation and transmission equipment shall comply with applicable building, mechanical, fire, seismic, structural, and electrical codes.
* The project, including supports and power conductors, shall not interfere with roof drains, water drainage*,* expansion joints, air intakes, existing electrical and mechanical equipment, existing antennas, and planned areas for future installation of equipment shown on drawings.
* All proposed/implemented PV array locations shall be shade-free from 8 a.m. to 4 p.m. (solar time). The contractor shall provide documentation of shading calculations (manual or 3D rendering methods) for exterior extents for each proposed array.
* Only products/equipment that are procured from the local PV equipment producer/supplier or Tier 1 PV manufacturer PV modules shall be used as components in the project.
* Construction and Electrical design of PV systems must comply with Tajikistan’s Building and Electrical Codes.

[Maybe to add this in between]

Site Visit, Solar Potential Assessment, Preparation of Feasibility Report for Identified Locations of Rooftop Solar (RTS) PV system.

**Subcontractor’s Responsibilities.**

The Subcontractor is required to provide:

* Reports and engineering calculations that are signed and sealed by a licensed architect or professional engineer in the appropriate discipline of the subject design drawings (e.g. architectural, geotechnical, electrical, structural)
* Conceptual Design Drawings (mounting, electrical and others)
* Final Design Drawings (mounting, electrical and others)
* Bill of Quantities for construction materials, and equipment
* Submittals for materials and products
* A quality control plan (QCP)
* A safety plan
* Inspections and tests (per QCP)
* Manuals (e.g., design calculations, operation/maintenance, a shop drawing, etc.)

1. **Scope of work**

**Overview**

A complete 73 kW grid connected PV system are requested for permanent power supply for the MEWR. PV systems should replace (part of) the energy normally purchased via the grid supply.

Information about the building:

* Location of the building: 38.58N, 68.75E
* Available space for roof mounted solar panels in the MEWR’s building is about 560 m2.
* The current main supply of the electricity is from the electricity utility grid.

The proposed Solar PV systems shall consist of all the necessary equipment/components, including, but not limited to the following:

* Solar PV modules consisting of required number of Crystalline PV cells.
* On-grid Inverters
* Mounting structures
* Junction Boxes.
* Earthing and lightening protections.
* IR/UV protected PVC Cables, pipes and accessories

The Scope of Work consists of two phases: “*Phase 1. Design and Procurement of the Solar PV System*” and “*Phase 2: Installation, Commissioning, and Training*”. The First phase is approved and will the Subcontractor will start the work on the project immediately after winning the bid. **Second phase is conditional and will be granted to the Subcontractor upon receiving approval from USAID.**

**Phase 1. Design and procurement of the solar pV system**

**Preliminary Design of the PV systems**

**Site Survey**

The contractor shall conduct the site survey, that includes, but not limited to following:

* Visit he MEWR for to gather the necessary information about the installation location (Within the first week after the award of the contract).
* Identify best available climatic data to be used in system sizing (from the local meteorological stations or purchased validated solar data from sources like Solargis).
* Conduct Initial shading analysis.
* Review and calculation of consumption profile given by the MEWR (appliances and daily use, including surge loads).
* Inspect the roof load bearing capacity and select of a suitable support/mounting for the proposed system.

**Concept Drawings.**

The Subcontractor shall provide Tetra Tech with conceptual design drawings that includes, but not limited to following:

* The conceptual design drawings that indicate the proposed location of the PV array(s) and access points along with an engineering and electrical drawings. It should also include basic design of the PV system and power evacuation plan (Wiring diagram of the entire installation)
* The design layout of RTS PV system carried out using 3D design software, such as SketchUP, 3ds Max, AutoCAD or other industry-recognized 3D design software tools)
* The PV system layout of RTS PV system carried out using PVsyst, PV\*SOL, or other industry-recognized PV design software tools)
* The conceptual design drawings shall include major equipment information, proposed installation/interconnection information, applicable incentive information, and performance characteristics of the system. It needs to make sure to indicate an appropriate location for the solar PV inverter equipment and its related components and environmental control systems that will meet the following criteria:
  + Ease of maintenance and monitoring
  + Efficient operation
  + Low operating losses
  + Secured location and hardware
  + Compatibility with existing facilities
  + Avoidance of flood-prone areas
* Appropriate sizing cable lengths and dimensions for maximum 2% voltage loss at nominal load.
* Appropriate sizing inverter(s) for the necessary surge load capacity.

At a minimum, the proposed concept information shall include:

1. Equipment Information

* System description
* Layout of installation
* Selection of key equipment and layout of equipment
* Performance of equipment components and subsystems
* Specifications for equipment procurement and installation
* All engineering associated with structural and mounting details
* Controls, monitors, and instrumentation

1. Installation Interconnection Information

* Solar electric array orientation (degrees)
* Solar electric module tilt (degrees)
* Electrical grid interconnection requirements
* Integration of solar PV system with other power sources
* System type and mode of operation (utility interactive)

1. Performance Characteristics

* Shading calculation documentation
* Total system output (kWh/year)
* Estimated kWh/month per array (shown over a 12-month period)
* Warranties and guarantees

1. Interconnection Agreement

* Provide confirmation that the PV system will be designed to comply with applicable building and interconnection requirements

**Final Design of the PV systems**

The solar PV system shall be designed and engineered to maximize the solar energy resources, taking into consideration the customer’s electrical demand and load patterns, available solar resources, existing site conditions, proposed future site improvements, and other relevant factors.

Design services for this project shall require a schematic design submission, a design development submission, a check set submission, and a construction document submission. A final set of as-built drawings shall also be provided to Tetra Tech. The design package shall include the following details:

1. **Specifications.** Specifications that express all information and demonstrate sufficient detail so as to direct the construction work outlined in this statement of work shall be required. The specifications package shall be coherent enough that any contractor not familiar with the project would be able to construct the project design. The specifications shall include all equipment information, proposed installation and interconnection information, and performance characteristics of the system. A construction plan producing a minimum disruption of day-to-day activities, utilities, services, etc.
2. **Construction and Electrical Drawings**

* Provide drawings for each discipline required (architectural, structural, electrical, etc.), with separate plans for new work and demolition as well as special types of drawings where necessary, such as enlarged plans, equipment curbing and flashing details, roof penetration details, etc. Drawings shall clearly distinguish between new and existing work.
* A cover sheet shall be provided and shall include a list of the drawings, legend, vicinity map, and location map in addition to all items required for each drawing. At a minimum, the following drawings are required:
  + Site plan including utility locations and connections – showing staging and phasing requirements
  + Electrical plans – including single line diagram and utility interconnection
  + Electrical details
  + Roof plan – showing the full layout of the system and detailing any obstacles that must be permanently or temporarily removed or relocated
  + Array support and mounting details
  + Any other drawings that may be required to install a complete project
  + Waterproofing details
* Specifically address the means to keep the existing building accessible and operational by means of relocation and/or phasing.
* Provide bill of material (BoM) inclusive of technical specifications for the main components.

1. **Calculations.** The contractor will provide the following calculations:

* **System Electrical Calculations**. Provide with design development and again with 100% check set.
  + PVsyst, PV\*SOL, or other industry-recognized PV design software tools for calculations
  + System energy production calculation showing estimated monthly and yearly energy output for each array
  + Energy value and project cash flow
* **Energy performance** calculated by a detailed PV analysis program such as PVsyst, PV\*SOL, or other industry-recognized PV design software tools using proposed specific PV modules and inverters.
* **Roof structural loading calculations**. These calculations shall specifically address roof loading from the PV array and confirmation that the loading does not exceed existing roof framing capacity as determined by the analysis.
* **Roof Structural Analysis.**This document provides some preliminary indications on the existing roof’s capability to carry additional loading and is intended to assist during the proposal process in developing the concept design. It is not intended to alleviate the need to do array-specific structural calculations during the subsequent design phases.
* **Shadow Analysis.** The bidder should carry out Shadow Analysis (manual or 3D rendering methods) at the site and accordingly design strings & arrays layout considering optimal usage of space, material and labor.

The Subcontractor will make sure that the proposed design received all required rights, permits, approvals, and interconnection agreements from governing agencies and the utility company at no additional cost to Tetra Tech. For each design/drawing submission, Tetra Tech reserves the right to make comments and request changes after the receipt of the submission.

**Procurement**

After the completion of the design phase of the PV systems, the Subcontractor should choose and procure all the systems components. The following are the technical requirements for each component. Before the procurement, each chosen components have to be approved by Tetra Tech in a written form.

**Technical Requirements of the Main Components**

**Photovoltaic Modules**

* PV modules shall be procured from the local PV equipment producer/supplier or Tier 1 PV manufacturer.
* The PV modules must qualify to the latest edition of IEC PV module qualification test or equivalent BIS standards Crystalline Silicon Solar Cell Modules IEC 61215/IS14286. In addition, the modules must conform to IEC 61730 Part-1 - requirements for construction & Part 2 - requirements for testing, for safety qualification or equivalent IS.
* The PV module manufacturer shall provide warranty as a minimum: No module will generate less than 90% of its specified minimum power when purchased.
* PV modules shall have a 25-year limited warranty guaranteeing a minimum performance of at least 80% of the original power for at least 25 years
* The chosen PV panels should have junction box with accessible bypass diodes, Anti-reflective glass cover, and be PID (potential induced degradation) proof.
* Each module must be individually labelled with serial number, flash test and EL report.

The Subcontractor should provide Tetra Tech with 1% extra PV panels.

**Inverters and Controllers**

* Inverters and other power electronics shall be procured from the local PV system equipment producer/supplier or Tier 1 manufacturer of PV equipment.
* Provide detailed lock-out/tag-out instructions for all equipment.
* A minimum 10-year manufacturer’ s warranty shall be provided.
* The inverter shall also house MPPT (Maximum Power Point Tracker). Inverter output should be compatible with the grid frequency.
* The inverter shall have anti islanding protection in conformity to IEEE 1547/UL 1741/ IEC 62116 or equivalent BIS standard.
* The inverter shall have an option for the remote control and monitoring.
* All necessary fuses, circuit breakers, cable switches and other required ancillaries shall be provided.
* Solar Charge Controllers must have protection against overload and reverse polarity and be compatible with lead acid battery systems
* As a quality assurance, Solar Charge Controllers shall conform to IEC 62093

**Cables**

* Cables should be flexible and have an excellent resistance to heat, cold, water, oil, abrasion, UV radiation. All cables and connectors must be of solar grade which can withstand harsh environment conditions including High temperatures, UV radiation, rain, humidity, dirt, salt, burial and attack by moss and microbes for 25 years and voltages as per latest IEC standards.
* For the DC cabling, XLPE or, XLPO insulated and sheathed, UV-stabilized single core multi-stranded flexible copper cables shall be used; multi-core cables shall not be used.
* For the AC cabling, PVC or, XLPE insulated, and PVC sheathed single or, multi-core multi-stranded flexible copper/Aluminum cables shall be used; Outdoor AC cables shall have a UV-stabilized outer sheath.
* Cables and wires used for the interconnection of solar PV modules shall be provided with solar PV connectors (MC4) and couplers
* The cables have to be supplied with the UV-stabilized PVC conduit pipe of adequate diameter.

**Warranty of the components**

Each component of the PV System shall have warranty certification/documentation and replacements arrangements (technical and logistical) inclusive of appropriate escalation measures. Cost associated with warranty replacements during the warranty period will be borne by the Subcontractor.

**Phase 2: Installation, commissioning, and training**

The Subcontractor will be responsible for controlling the installation of the RTS equipment at the identified sites, monitoring performance testing, and final commissioning of the facility.

The Subcontractor will be responsible for technical oversight and maintenance of the installed RTS until the end of the pilot project.

The Subcontractor will develop a maintenance manual for RTS and provide capacity-building training for personnel of the beneficiary in charge of operations and maintenance of RTS to ensure the sustainability of the project.

The Subcontractor shall be responsible to bear warranty for installation/commissioning works at least 12 months from the date of final acceptance act signature by the sides.

**Installation**

The following actions should be included, but not limited in the Installation phase of the project:

* Civil Works and Site Preparation: implementation and/or technical guidance by vendor or by vendor appointed local/regional representative.
* Required electrical works for integration of the PV System with Generator and Grid.
* PV array mounting and cabling with weather proof connectors.
* Cabling from inverter to new AC switchboard with two outlets (critical and non-critical loads).
* Lightning Protection. Provide surge protection on all electrical systems.
* Pre-assembling and wiring: mounting of inverters, controllers and the likes done as much as possible in a factory/lab environment.
* System shall be installed in accordance with the national and international codes and standards
* Each inverter and associated controls shall be properly installed according to the manufacturer’s instructions.
* Warning labels shall be posted on the control panels and junction boxes indicating that the circuits are energized by an alternate power source independent of utility-provided power.
* Operating instructions shall be posted on or near the system and on file with facilities operation and maintenance documents.
* Provide detailed lock-out/tag-out instructions for all equipment.

**Commissioning**

The following actions should be included, but not limited in the Commissioning phase of the project:

* Perform inspections and tests throughout the construction process, including: existing conditions/needs assessments, construction installation placement/qualification measurements, and final inspections/tests performance certification.
* The system shall meet minimum guaranteed generation with minimum of 75% of Performance Ratio (PR) at the time of commissioning.
* All equipment specifications shall match the proposed equipment specifications
* The electrical system as laid out and connected aligns with the as built one-line diagrams including fuses, relays and switches with variation to proposed system noted
* Each array shall pass the open circuit voltage and current test
* The manual disconnect switch shall be tested to operate correctly
* The commissioning phase shall be conducted by the certified commissioning engineer

**Training**

The following actions should be included, but not limited in the Training phase of the project:

* Development of manuals in Russian language: All the manuals of the equipment, as well as the operation and maintenance procedures and guidelines shall be prepared and provided to the MEWR
* Training for the monitoring, periodic check of PV station, troubleshooting, preventive maintenance, and other necessary for the PV station topics.

**Deliverables and Schedules**

For each report/design/drawing submission, Tetra Tech reserves the right to make comments and request changes after the receipt of the submission.

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| **#** | **Phase** | **Deliverable** | **Payment** | **Deadline** |
| **1.1** | **Preliminary design of the PV systems** | * Report on the preliminary design of 73 kW on-grid system that includes the following:   + Site Survey   + Concept Report (with electrical and mounting drawings)   + Preliminary PV performance output report | 10% | 2 weeks from the contract award |
| **1.2** | **Complete/Final Design of the PV systems** | * Report on the final design of 73 kW on-grid system, that includes the following:   + Construction and Electrical Drawings   + Annual Energy Yield calculations   + Energy performance calculations   + Roof structural loading calculations.   + Roof Structural Analysis.   + Shadow Analysis | 10% | 6 weeks after the completion of phase 1.1 |
| **1.3** | **Procurement** | * Procurement Report that indicates consist of Bill of Quantities with all system equipment/components, including, but not limited to the following:   + Solar PV modules consisting of required number of Crystalline PV cells.   + On-grid and Off grid Inverters   + Batteries (for Off-grid system)   + Mounting structures   + Junction Boxes.   + Earthing and lightening protections.   + IR/UV protected PVC Cables, pipes and accessories | 30% | 12 weeks after the completion of phase 1.2 |
| **2.1** | **Installation** | * Installed and connected to the grid 73 kW on-grid PV system * Report on the installation process | 30% | 2 weeks after the completion of phase 1.3 |
| **2.2** | **Commissioning** | * Commissioning report which reflects the commissioning process and the results. | 10% | 1 week after the completion of phase 2.1 |
| **2.3** | **Training** | * Training for the MEWR which shall include but not limited to the following:   + Operation of the PV system   + Troubleshooting   + Preventive maintenance   + Monitoring * Development and translation of the all the equipment’s manuals * Development of manuals and guidelines for the operation and maintenance of the PV system. | 10% | 1 week after the completion of phase 2.2 |

ATTACHMENT B – DETAILED BUDGET

**PROPOSED DETAILED BUDGET**

The budget should be provided in Excel format with unlocked cells. The table below is sample; the Bidder can add revise the format if needed.



Prices quoted must be valid for 60 calendar days, and account for ALL remuneration, communications, report reproduction and other out-of-pocket expenses, taxes, and other costs, and including the VAT and other taxes that may be originated in Tajikistan. On this basis, Tetra Tech will issue a **Firm Fixed Price Subcontract**, and payment shall be based upon acceptance of services and deliverables described in the Attachment A.

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| ATTACHMENT C – REPRESENTATIONS AND CERTIFICATIONS |

**Bidder Representations and Certifications**

1. **Organizational Conflict of Interest Representation**

The bidder represents, to the best of its knowledge and belief, that this award:

does [ ] or does not [ ] involve an organizational conflict of interest.

*Please see FAR 52.209-8 for further explanation.*

1. **Unique Entity Identifier System (UEI) Number** *(required if price proposal is more than USD $30,000)*

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1. **Source and Nationality of Goods and Commodities**
2. This is to certify that the Bidder is:
   1. an individual who is a citizen or legal resident of .
   2. a corporation of partnership organized under the laws of .
   3. a controlled foreign corporation of which more than 50% of the total combined voting power of all classes of stock is owned by United States shareholders; or
   4. a joint venture or incorporated association consisting entirely of individuals, partnerships or corporations. If so, please describe separately the citizenship or legal status of the individuals, the legal status of the partnership or corporations, and the percentage (%) of voting power of the corporations.
3. This is to certify that the **Source** (the country from which a commodity is to be shipped from) of the Equipment to be supplied under this Order is:

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*name of country or countries*

By signing below, the Bidder certifies that the representations and certifications made, and information provided herein, are accurate, current, and complete.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Signature: |  | | Date: |  |
| Name of and title of authorized signature: | |  | | |