TETRA TECH

DEADLINE EXTENSION!

Request for Quotation

No. RFQ-USAID-PCA-2024-005

Procurement Tittle: "Solar PV Expansion for Murghab System", Tajikistan

Issuance Date: 05/06/2024

Deadline for Receipt of Questions: June 19, 2024, at 18:00, Dushanbe, Tajikistan, local time

Closing Date and Time: July 11, 2024, at 18:00 Dushanbe, Tajikistan, local time

Issuance of this RFQ does not constitute an award commitment on the Tetra Tech ES, Inc. and/or Pamir Energy *nor does it commit to pay for any costs incurred in preparation or submission of comments/suggestions of a quotation. Quotations are submitted at the risk of the offerors. All preparation and submission costs are at the offeror's expense.*

TETRA TECH

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1. INTRODUCTION

The purpose of this RFQ is to award to a qualified contractor, who will be supported by the regional utility Pamir Energy, for the provision of the engineering, procurement, delivery, installation and commissioning of grid connected Solar PV generation facilities, with at least 300 kWp (OPTION 1) or 400 kWp (OPTION 2) of nameplate power output, to provide additional capacity to the existing Solar and BESS systems within the distribution network of Pamir Energy in Murghab, Pamir, Tajikistan, fulfilling the technical requirements and scope defined in Attachment A – Project Specifications.

2. BIDDER'S QUALIFICATIONS

Bidder and teamed or partnered entities, if applicable, must provide the following information and references in order to be qualified for the procurement process:

1. Bidder's information, including official registered title, type of business, address, and contact person information.
2. A short description of the bidder and of past similar experience in providing projects or related services described in the Attachment A – Project Specifications.
3. Overall technical approach and design's functional and operational description to provide the functionality and fulfill the specifications defined in Attachment A – Project Specification.
4. Certification that bidder is not owned or controlled in total or in part, directly or indirectly, by any entity of any government.
5. Certification by any subcontractor engaged by the bidder for this project that the subcontractor is not owned or controlled in total or in part, directly or indirectly, by any entity of any other government.
6. The bidder shall complete and sign the Representation and Certifications found in Attachments C to this document and include them with the bidder's quotation. Quotations that do not include these certifications will not be considered.
7. Bidder can submit proposal as a consortium of several companies or organizations from the Republic of Tajikistan or other foreign countries. The foreign partners must be within the geographic code 937 and/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 relevant experience, past and/or current, in providing similar delivery 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.

3. SOURCE, ORIGIN AND NATIONALITY RESTRICTIONS

The USAID authorized geographic code for this Project is 937, encompassing the United States, the recipient country (Tajikistan), 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 Offers not in compliance with the geographic code without prior written approval may result in disqualification of the bidder from consideration for award.
Companies related directly or indirectly in any way or form with the Russian Federation and/or People's Republic of China are not eligible.

4. SUBMISSION OF QUOTATIONS

All quotations are due on July 11, 2024, no later than 18:00 local time in Dushanbe, Tajikistan. Quotations must be submitted via e-mail at the address pcabids@tetratech.com in the following formats: Adobe Acrobat PDF and/or Microsoft Word and Excel.

All quotations 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**. Quotations received after the above-stated due date and time will not be considered for this procurement.

5. QUESTIONS AND CLARIFICATIONS

All questions or clarifications regarding this RFQ must be in writing and submitted, in English, to pcabids@tetratech.com on or before June 19, 2024, by no later than 18:00 local time in Dushanbe, Tajikistan. Questions and requests for clarification, and the responses thereto, will be circulated to all RFQ recipients.

Only written answers from Tetra Tech will be considered official and carry weight in the RFQ 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 RFQ.

Interested bidders are encouraged to register their intention to submit a proposal. Note that the responses to questions, as well as any modification to this RFQ will only be sent to registered interested bidders.

6. QUOTATION PREPARATION INSTRUCTIONS

All Bidders must follow the instructions set forth herein in order to be qualified for the procurement process. If Bidder does not follow the instructions set forth herein, Bidder's quotations may be eliminated from further consideration, or the quotation may be downgraded and not receive full credit under the applicable evaluation criteria.

The suggested outline for the Quotation is stated below:

A. Organization's Information

1. Bidder's, teamed partners and appointees if applicable, organization's information, including official registered title, type of business, list of offices if applicable, address, telephone, and website.
2. Bidder's organization's office or appointee/s in approved territories defined in point 3.
3. If the proposed fixed price is above $30,000, the 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 number may be found here: https://sam.gov/content/duns-uei
4. Authorized point of Contact with phone number(s) and email address.
5. Certificate of non-affiliation nor ongoing business with persons or entities of the Russian Federation.

B. Company Technical Capability

Description of bidder's experience, which shall include alike activities/projects carried out in alike environments which, at bidder's criteria, are relevant to support bidder's capacity to deliver the requested scope.

C. Company Past Performance

Bidders should provide a summary of relevant projects including the Title, Client, Date and a brief description of alike scope delivered. The qualifications section is limited to 5 of the most relevant assignments performed in the last 5 years, presented in the following table format, from which those of alike nature and application are preferred:

Title of Assignment	Description of the assignment	Client Name	Dates of Execution

D. Detailed Budget

Bidder shall complete the **Table 1 of the Attachment B "Detailed Budget"** in order to allow Tetra Tech ES, Inc. to compare all quotes and make a competitive selection. The budget should be provided in Excel format with unlocked cells and shall not exceed the budget cap of 500,000 USD allocated for this project.

A price must be provided for each project component to be considered compliant with this request. Offers must show unit prices, quantities, and total price. All items, services, etc. must be clearly labeled and included in the total offered price. The quotations shall also include a budget narrative that explains the basis for the estimate of every cost element or line item if the item is not self-explanatory.
The supporting information must be provided with enough 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 of the reasonableness, realism, or completeness of an Offeror's proposed price.

Bidder shall provide unit pricing in USD. Prices quoted in this document shall be valid for a 60-day time period, include all taxes, duties and other costs and the VAT/tax originated in Tajikistan.

E. Technical Approach

The bidder shall provide as minimum the following information:

- A description of the proposed system architecture, functionalities and how the required functionalities will be achieved in the project's environment with the proposed system and justified calculations.
- A description of the functionalities that the proposed system can't provide or would require non-standard works by the bidder or suppliers; if non-standard works are required, the functionality to be implemented and the associated works shall be shortly described, and the cost shall be listed as individual component in the quotation page or pages.
- Price Quotation can be presented in the form of a "list of materials", comprehending the main components of the system, with a short description of the function of each component, the units required and value of the component or service. This listing shall include all non-standard works as an individual component; associated services, like installation, commissioning, training and other alike, are also considered main components and shall be listed individually.
- Small components, such as cables, connectors, and others alike, can be listed aggregated as "BoS" or "Various".
- If any component of the proposed system is based on a subscription or periodic fee, it should be clearly mentioned in the description of the component, together with the period duration.
- Description of the warranties and after warranty support services, reflecting their associated costs, shall be listed and consistent with the requirements defined in Attachment A.
- Bidder can add, in pages different from the above, any relevant information about the proposed system, components, functionalities or operation modes and added value services envisioned.

F. Representations and Certifications

These documents can be found in Attachments C of this RFQ and must be submitted as part of the Quotations.

All Quotations must be submitted in English.

7. EVALUATION CRITERIA

Award will be made to the bidder representing the best value in consideration of technical approach, added value services proposed, past performance and qualifications and price factors. 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) in order to identify the best value offer. Award of any resulting Subcontract Agreement shall be made by Tetra Tech on a best value basis. Tetra Tech reserves the right to request a test assessment from bidders to assess their qualifications.

Quotations will be scored on a 100-point scale. Available points for each evaluation factor are given below. Bidders must address each evaluation factor:

Evaluation Criteria		Points
I.	**Technical Approach, Design and Added Value Services**	30
II.	**Past Performance**	30
III.	**Price Quotation**	40
TOTAL		**100**

Bidder should submit a **Detailed Budget** reflecting the cost of completing the scope. Bidders shall use and complete the **Attachment B – Detailed Budget**.

8. TERMS OF PAYMENT

The validity of the award will be contingent to the presentation by the awardee of a contract's performance liquid warranty, within the next 30 working days after formal award notification, for an amount equivalent to the 20% of the capital cost of the main components, those being, panels, inverters, mounting structure and HV transformer, which will be released after the successful commissioning of the plant.

Payment terms for the awarded contract are net forty-five (45) days upon satisfactory completion and acceptance of milestones and deliverables by Tetra Tech or his appointees; milestones which are listed in Attachment A – Project Specifications. Payment shall be made by Tetra Tech via bank wire transfer.

9. DUNS NUMBER AND SAM.GOV 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 number may be found here: https://sam.gov/content/duns-uei

10. NEGOTIATIONS

It is anticipated that a subcontract will be awarded solely on the basis of 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 offerors in the competitive range to permit an efficient evaluation environment among the most highly-rated proposals. Highest-rated offerors, as determined by the evaluation committee, may be asked to submit their best prices during a competitive range.

11. MULTIPLE AWARD/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 – PROJECT SPECIFICATIONS

TECHNICAL SPECIFICATION

SCOPE OF WORK: Engineer, procure, deliver, install, and commission, excluding those works and services provided by Pamir Energy (listed below), a 10kV Grid connected, ground mounted, Solar PV generation system generation facilities, with at least 300 kWp (OPTION 1) or 400 kWp (OPTION 2) of generation output power in total. The system will be installed next to the existing Solar and BESS plants in Murghab area. The new Solar will be connected to the 10 kV distribution network, which is already available on site.

Bidders must submit separate quotations for each option. Tetra Tech will evaluate both options and select one for implementation.

PERIOD OF PERFORMANCE: 7 months from the contract conclusion date.

PLACE OF PERFORMANCE: Site near Murghab; center of Murghab District in the Pamir Mountains of Gorno-Badakhshan Autonomous Region, Tajikistan.

Background

The recurrent reduction of available water for the hydro plant to fully support the grid demand during the winter months combined with a shallow but constant demand growth, is driving Pamir Energy to further expand the existing system and generation mix.

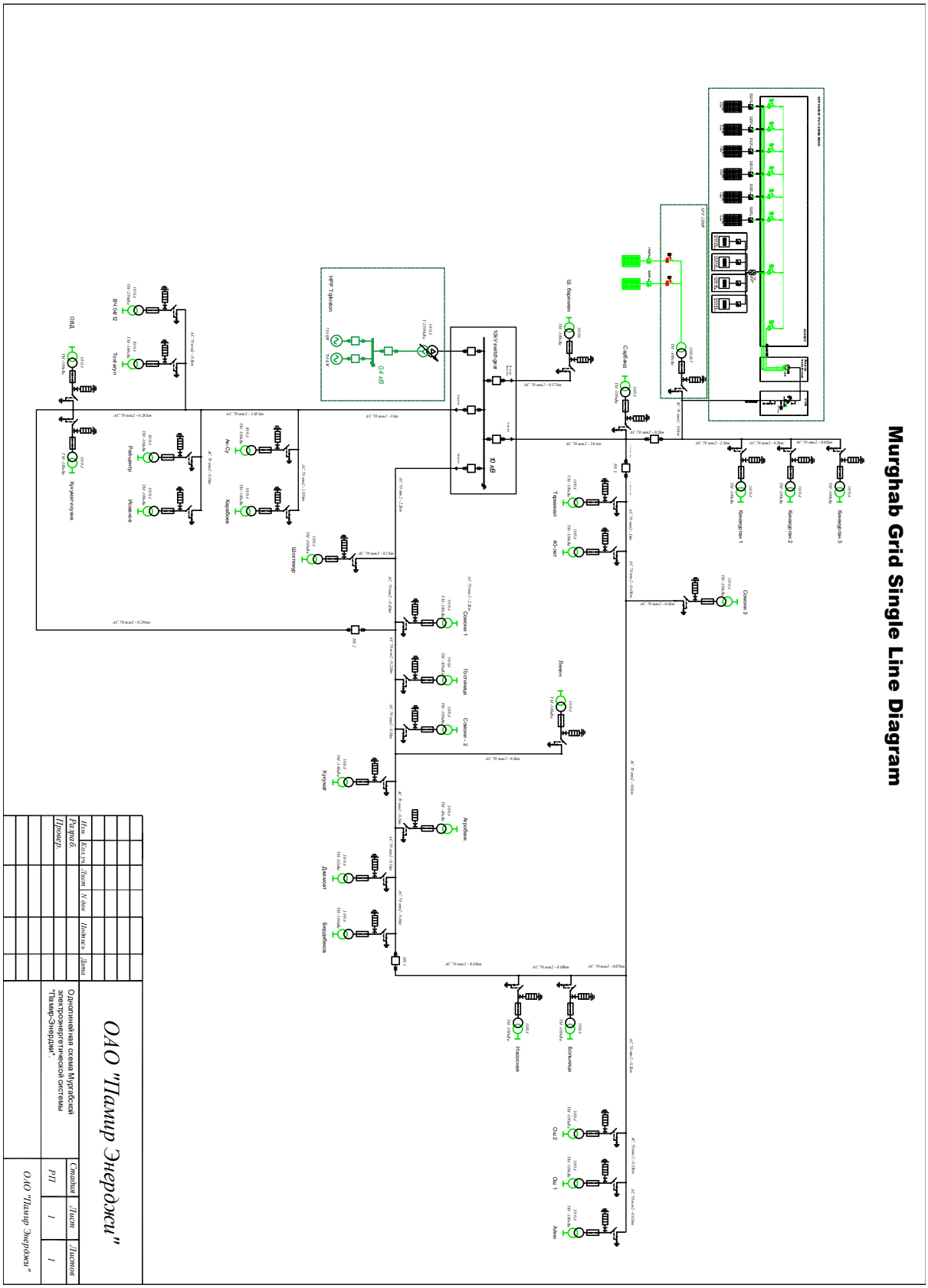
With the support of USAID, IFI's and donor funding, in 2020 Pamir Energy commissioned in Murghab a first pilot project in 2020, with 180 kW / 180 kWh of BESS and 200 kWp of solar generation, this power system in Murghab area has been further expanded to the present 1.38 MWh of BESS and 800 kWp of solar generation and operates in coordination with the existing river-run hydro power plant.

Grid conditions & location

The region's isolated grid, which serves the township of Murghab and Kanakurgan village, has a 10 kV distribution network operating at 50 Hz, with low voltage of 400 V for three phase and 230 V for single phase.

The distribution network has 3 main radial circuits, east and west, with one looped serving Murghab which are presently powered by an utility's owned and operated river-run single hydro power plant, having 2 x 750 kW turbines or generation units, providing 2 x 750 kW (1,500 kW) of maximum capacity during the summer season, which is reduced to 1 x 750 kW along the winter season, effectively curtailing the demand to the available generation. The hydro plant is located in an approximate position which is equidistant between the two served cities.

The power output and operation of the hydro plant's generation units is managed with a proprietary AGC and generators are capable of remaining connected in a frequency range between 40 and 60 Hz, while the normal operation frequency range is 48.5 to 51.5. The actual load curtailment rate is 10 kW per each 0.1 Hz below 48.5 Hz.


Murghab Grid Single Line Diagram
ОАО "Памир Энерджи"
Однолинейная схема Мургабской электроэнергетической системы "Памир-Энерджи".
Стадия
Лист
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ОАО "Памир Энерджи"
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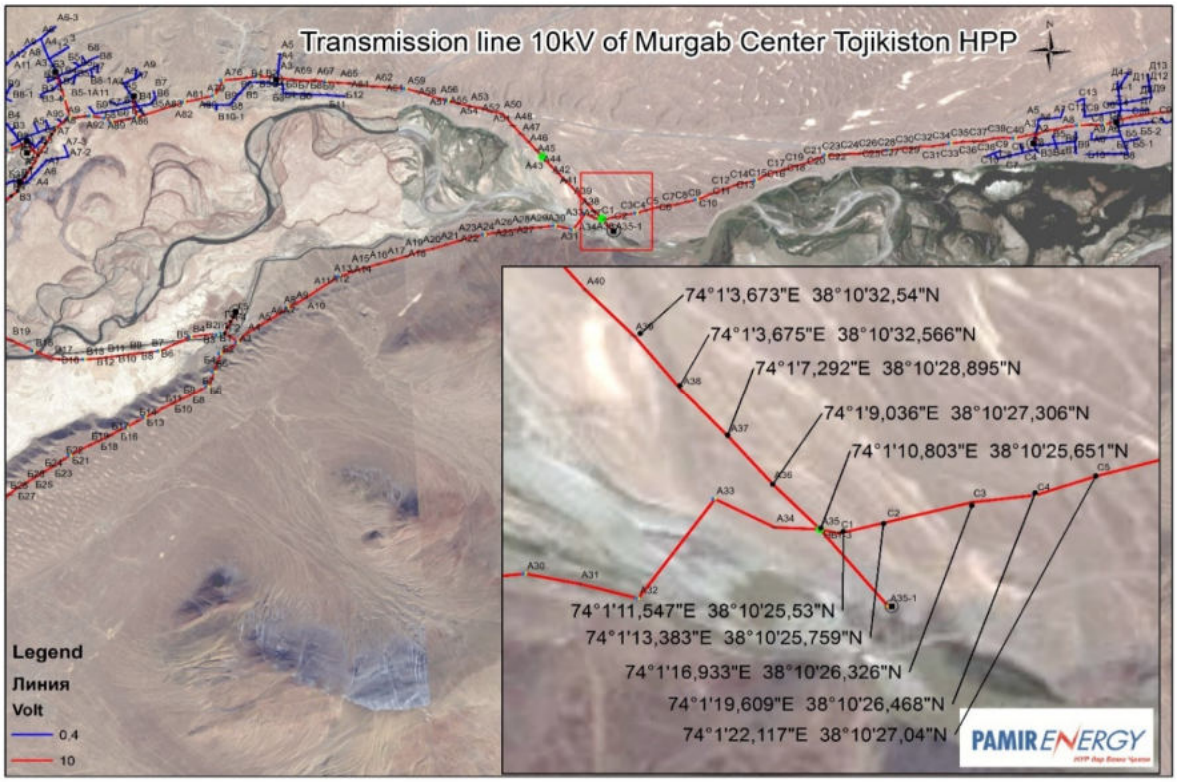


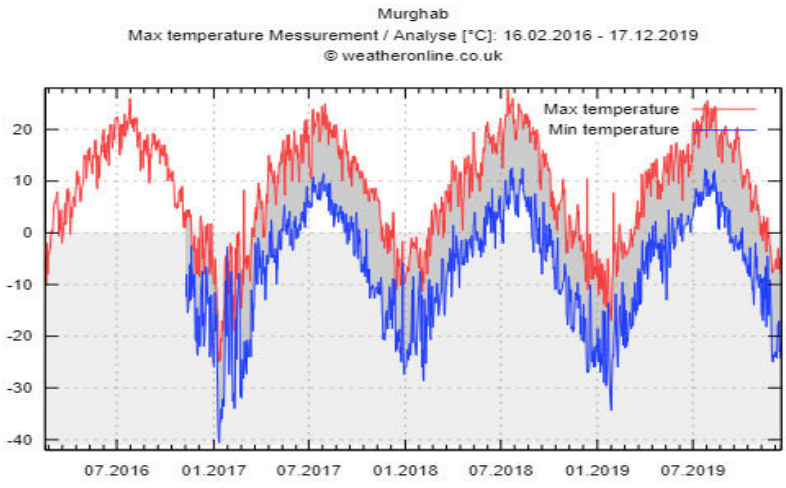
Environment & Weather

The township of Murghab is the center of Murghob District in the Pamir Mountains of the Gorno-Badakhshan Autonomous Region of Tajikistan. With a population of 4,000, Murghab is about the only significant township the eastern half of Gorno-Badakhshan, being the highest township in Tajikistan at 3,650 m above sea level and experiences relevant below 0 conditions in winter, which may reach -40 C, both are likely to affect the operation ranges of the equipment, which bidders shall account for in their proposed designs and equipment selection and reminded of the derating implications from altitude combined with the repercussions from temperature levels.

Average values of weather relevant information can be found at Average values of weather relevant information can be found at
http://www.weatherbase.com/weather/weatherall.php3?s=605181&cityname=Murghab%2C+Gorno-Badakhshan%2C+Tajikistan&units=

https://www.weather-atlas.com/en/tajikistan/murghab-climate

https://www.woeurope.eu/weather/maps/city



Plant's proposed sites

The allocated site, which will be next to the existing solar plants, is approximately 6 km east of Murghab township, and 3.5 km south of the airstrip by road, equivalent to 1.5 km in straight line. The distance from the hydro power plant, which provides most of the area's power, is about 600 m in a straight south-south-west direction.

The UTM W84 coordinates of the allocated plot are 414355.00 m E and 4225826.00 m N in zone 43 S, equivalent to 38.176383° decimal Latitude and 74.022331° decimal Longitude.

The site area can be reached by paved road from Murghab and Kanakurgan, followed by a transit of about 900 m over drivable sand tracks to the plant's allocated plot.

Site's soil conditions

On visual inspection of the groundworks already performed, the soil is mainly composed of low-density clay, limestone, and granitic origin sands, with profusion of medium to coarse gravel (ISO 14688) or pebbles of piedmont origin, both on surface and underground.

The high participation of clay provides little absorption of rainwater, which will tend to form shallow ponds and will wash down towards the southern part of the site and general area.

The ground resistance measurements performed indicate a ground resistivity in excess of 200 Oh. Bidder designs shall account for this circumstance and provide adequate components to achieve adequate grounding resistance. This grounding improvements shall also be accounted for in the lightning protection system.

Contributions of Pamir Energy to the works and costs of the project

To support the project implementation, once this project is awarded and, as by the EPC schedule to be provided by the awardee Pamir Energy, at his own cost and with own resources will perform the following works and services to the benefit of the awardee, helping to reduce the overall cost.

Pamir Energy Preparation Scope

- Obtaining of rights for the site, building permits and power plant operation license.
- Site preparation, with clearance, leveling, backfilling, and compacting, leaving the site ready to accept the system's installation.
- Site fencing has been completed on all 4 sides of the site.
- Fence gates have been delivered and installed.
- Transformer pad, executed in reinforced concrete, is completed and ready to accept the installation of the transformer inclusive of cabling ducts and routes.
- Equipment enclosure to host inverters, AC protections and telecom components, has been completed, inclusive of incoming and outgoing cable ducts, and internal cable pits.
- Trenches for AC and DC to and from their anticipated positions to the equipment enclosure and to the transformer pad.
- Interconnection feeder poles including the plant's interconnection pole.

Scope of Works to be executed by Pamir Energy, Once this project is awarded.

Once this project is awarded and, as by the EPC schedule to be provided by the awardee, Pamir Energy will perform the following works,

- Trenching, pulling and installation of the grounding system and lightning grounding system.
- Pulling and installation of the lighting and surveillance system.
- Cable pulling, terminations and installation of DC, AC, grounding, lightning and lighting.
- Termination and connection of the HV cables, on transformer, outgoing switchgear.
- Installation and HV connection cabling to recloser at interconnection pole.
- Installation of HV interconnection components (to be supplied by bidder).
- Supply, installation, and termination of the HV cabling from HV transformer to poles.
- Closing and compacting of trenches and sealing of ducts.
- Installation of the fiber optics cable from the site to the hydro power plant.
- Site cleaning and final conditioning.
- Maintenance, operation, and landscape.

Scope of services and support to be provided by Pamir Energy

Once the project is awarded and, as by the procurement and EPC schedule to be provided by the awardee, Pamir Energy will provide the following services,

- Clearance of customs and duties, inclusive of all costs and customs transit.

- Transport means and costs from customs to the site.
- Unloading and positioning of the equipment on site.
- Facilitation and support in local procurement of machinery and labor.
- 20 Tm tractor with hydraulics for ramming head (excluding ramming head).
- Support for obtention of local logistics, welfare, and regional suppliers.
- Labor support on all installation works.
- Appointment and availability of the selected personnel to be trained.

Scope of equipment and services to be provided by bidder.

The awarded bidder will, in compliance with IEC and European applicable standards, procure, deliver, and execute the engineering, procurement logistics, installation, testing, commissioning and create the applicable OM schedule and program of,

- Solar panels with an aggregated capacity enough for the solar system to deliver a minimum of 300 kWp (OPTION 1) or 400 kWp (OPTION 2) at site's yearly average radiation, from Tier 1 listed manufacturer. Bidders are encouraged to evaluate feasibility of Bi-Facial panels.
- DC Combiners as required by the design proposed by the bidder.
- DC Protections as required by the design proposed by the bidder.
- Mounting structure or racking system, fix orientation and tilt, adequate for the size and number of panels to be provided and suitable for the environmental and soil conditions of the site, with the adequate tilt and row spacing for optimal energy performance along the year.
- Inverter or inverters, adequate for the installed capacity of the solar panels and the site conditions, minimizing clipping and power conversion losses and, to be fully monitored and actively managed, with TER envelope, R-Rate, VAR and Q being programmable and adjustable from Pamir's Energy Control Center if needed, with the adequate software and/or interface (which shall be provided).
- The inverters must have Grid Forming or Black Start capabilities enabled, alternatively they must be able to switch from Grid Following to Grid Forming upon instruction delivered from the hydro plant control center.
- The inverters must comply with EIC 61850 set of communications protocols for eventual integration in area Energy Management System or scada from NR.
- AC Combiner as required by the design proposed by the bidder.
- AC Protections as required by the design proposed by the bidder.
- AC switchgear and bus adequate for the connection to the HV transformers.
- Auxiliary power source and system to operate motorized switchgears, enclosure's temperature control system, telecoms and remote management systems, weather station, reclosers and site surveillance system in case of grid failure, at least, for 48 hours.
- Equipment enclosure's temperature control system, if required by selected components to be hosted.
- DC, AC, HV, cables and grounding wires as required by the design proposed by the bidder.
- Grounding network and components as required by design and to meet IEC safety and protections standards according to the site's ground resistance (> 200 Oh).
- Onan type transformer/s, pad mounted, with tap off load, complete in enclosure with LV and HV switchgears and ready to connect, from 400 V to 10 kV, of adequate capacity for the proposed LV capacity as by the proposed design and operation of the Solar pv generator/s.

- The following HV interconnection components:

  1) Disconnector/Recloser of 10 kV - outdoor installation, remote control (rod) with grounding knives on one side (2 pieces).

  2) Voltage transformer 10 / 0.1 kV, three pieces (for each phase 1 piece) or 3-phase (1 piece), cast, for outdoor installation.

  3) Current transformer, with transformation ratio 4 Secondary current 5 A. 3 pieces (1 piece for each phase). Two current secondary windings in each current transformer - for protection and for accounting. Accuracy classes - respectively windings 1 and 0.5.

  4) Vacuum circuit breaker 600A (recloser) for remote wired command.

  5) Protections - Standard set of protections for current, voltage and frequency transformer, which will feed the reclosers and metering units.

  6) Surge arresters 12.5 kV. Three pieces (1 piece for each phase), polymer. For protection of meter and reclosers to be installed on pole before transformer and reclosers.

  7) For transformer to feeder interconnection:

  - Overhead: Glass or resin Insulators, rated for 10 kV.

  - Underground and/or modular : Insulated derivation to connect the recloser's voltage and current transformers.

  8) Conductor - Bare AL 50 with steel drive core. Length as required by design.

  9) Grounding conductor - connected to the Solar grounding. Flat CU or Steel cable 5mm thick, 25 mm wide, length 50 m.

- Weather station, complete with tilted and horizontal pyranometer (solar only), hygrometer, barometer, anemometer, wind direction gauge, air temperature, shadow temperature and panel temperature sensors (on those at the Solar PV plant/s); equipped with real-time telecommunications link and data storage capabilities.
- Complete Lightning protection system, adequate to protect the system and his components, according to applicable IEC standards.
- Surveillance system comprehending IR cameras with remote recording and LED flood lighting system activated by motion sensors and siren, to be activated with the siren only during daytime and together with the flood lighting during nighttime.
- Fiber optics cable from solar plant to hydro plant, and encoder/decoder data hub and interface, both on plant's site and Hydro plant.
- All software which may be required by any equipment and/or component for his local and/or remote operation shall be inclusive of supply, installation, programming, and operation.
- Training of Pamir's Energy selected personnel on the installation, operation, and maintenance of the Solar PV.
- Installation, testing, and commissioning of all the equipment and components supplied.

Minimum technical and quality requirements of the main equipment and components to be provided, installed, and commissioned by the bidder.

All equipment and components must be in accordance with applicable IEC or IEEE standards and all values will be in metric system.

Equipment / Component	Minimum technical and/or quality requirements
Solar panels	Generation warranty ≥ 80% at year 25. LID/PID immune. ≥ 400 Wp per unit. 3 Bypass diodes, if applicable to the panel's technology. Efficiency ≥ 18.5%. NOCT ≥ 44 Deg C. Bidders are encouraged to evaluate feasibility of frameless and Bi-Facial. Certification of compliance with all applicable IEC and CE standards and regulations, manufactured by a BNEF Tier 1 listed manufacturer third party.
Inverter/s	Utility scale string type. Recognized and reputed manufacturer. Euro efficiency ≥ 98%. Warranty extension ≥ 15 years shall be included. Complete DC protections with disconnector and surge arresters. Programmable ranges of frequency, power factor, under/over frequency, voltage and ground fault. Programmable ramping rate. Nominal AC voltage / AC voltage range: 400 V / 304 V to 477 V. AC grid frequency / range: 50 Hz / 44 Hz to 55 Hz. Rated grid frequency 50 Hz. Power factor at rated power / displacement power factor, adjustable from 0.6 to 1. Harmonic (THD) < 3%. Ground fault monitoring / grid monitoring / DC reverse polarity protection. AC short-circuit current capability. All-pole-sensitive residual-current monitoring unit. Monitored surge arrester (type II) AC / DC. Protection class (according to IEC 62109-1) / overvoltage category (as per IEC 62109-1) I / AC: III; DC: II I / AC: III; DC: II. Programmable Ride Through response to frequency and voltage. Reactive power generation capable. Grid forming and/or Black Start capable. Switching from Grid Following/Support available upon remote signaling. Modbus and/or TCP/IP communications IEC 61850 compliant for eventual integration with an IEC 61850 compliant SCADA from NR. Certificates and approvals IEC/EN 62109-1/-2, IEC 62116, IEC 61727 as minimum.
Mounting structure or racking system	All HDG elements in ≥ 90 microns coating, cut to measure and drilled in factory before HDG treatment. All AL elements in 6005T5 or above corrosion resistance. All steel in stainless steel 316L or above. All contact points between HDG and AL isolated with nylon, neoprene or equivalent insulator. All nuts, bolts and screws in STS 316L or above. All nuts and bolts with self-locking. Panel clamp locking screws with anti-theft heads or equivalent. Foundations adequate for site conditions, in HDG, either standard 6 m pile-in, or precast slabs. Two main supporting piles /pillars /poles /beams in HDG are recommended. Main beams /arms in HDG. Purlins or upper structure in AL. Panel clamps in AL. Warranty ≥ 15 years.
HV Transformers	400 V to 10 kV step up, Onan type, outdoors pad mounted, with de-energized tap changer (DETC), of adequate capacity for the proposed LV capacity as by the proposed design and operation of Solar Pv. Oil temperature and level gauges or displays are required. Recommended vectors: without neutral point on high-voltage side, Dyn1, Dyn5, Dyn11; Losses at 35% load shall not exceed 1.4%.
Weather Stations	For Solar Pv site/s: reputed manufacturer, hygrometer, barometer, anemometer, wind direction gauge, air temperature, tilted pyranometer, panel

	temperature sensor; equipped with real-time telecommunications link and data storage capability. The weather station shall remain operational in the event of grid failure.
Cabling	Cables shall be adequate for application according to IEC standards. All cables shall be certified UV resistant and outdoor rated, halogen free and PCV or XLPE sleeved, as per type. Cores can be solid or stranded but stranded is highly recommended for workability in site conditions. DC cables must be single core and routed so that arching is not possible. AC/LV can be single core or multicore, but single core is highly recommended for workability in site conditions. HV cables shall be AL single core stranded. Colors must be IEC standard (DC: +Red, -Black/Blue; LV: L1,Brown, L2,Black, L3,Grey, N,Blue; Ground: Yellow-Green striped; HV: Black with terminations taped in the required phase color). DC max losses, from string ends to inverter: 0.2%. AC max losses, from inverter to transformer: 2.0%. All cables will be tagged with reference numbers.
Cable Terminations	All terminations must be pre-insulated type, for mechanically crimped-on installation and rust proof. DC connectors must be MC4 type IP67 unless current limit is exceeded by system design. For AL cables terminations must also be bimetal.
Cable Routing	Solar DC cables shall be run on the mounting structure until either reaching the DC Combiners or if being pulled underground to reach the coupling point, all cables, DC, AC/LV, HV and fiber optics shall be ducted. DC/AC/LV Cables can also be run on 10 cm elevated HDG over-ground covered trays, shallow ground-leveled pre-cast trenches and open HDG or mesh trays inside the equipment enclosure.

Engineering Package. Minimum drawings, designs and other documents to be provided by the bidder.

Detailed georeferenced data of the available sites to be provided to awardee.

Drawings and designs by awardee before installation will be in metric system, georeferenced to site real-world coordinates using UTM W84 datum and layered by group of related components according to the construction and installation sequence and, delivered in A0 pdf format and A4 pdf subsections of the construction's relevant areas, for field usage. These documents will not be considered delivered or completed until formal acceptance by Tetra Tech.

- The complete EPC program or "EPC Master Plan", in MS Project, including complete task breakdown, dependencies, task ownership and required resources, from award to hand over; this will also be used as the coordinated project tracking tool.
- Concept of design and components.
- Generation and operation simulations with bankable software and datasets.
- Plant SLD's ready for construction.
- Site trenches or overheads, ducts trays, as applicable, by type, with detail and cross sections.
- Grounding system, with details and cross sections.
- Lightning protection system, with details and cross sections.
- Lighting and surveillance system, with details and cross sections.
- All Cables routes, with details and cross sections.

- Mounting system, with details and coordinates for each pile or foundation and cross sections.
- Panels layout and strings routings.
- DC Combiners and protections & DC Routes from Combiners to Inverters, if applicable by design.
- Inverters DC In / AC Out.
- AC protections & routes from inverters to AC Combiners, if applicable by design.
- Switchgears panels and cable routings, with Connections to LV, with details.
- HV cables routings, with details and cross sections.
- AC Connections to HV terminals, with details.
- General layout of site.
- Site inspection and snagging list.
- Cold testing procedures, including reference values.
- Hot testing procedures, including reference values.
- "As Built" Manual, including all the above final documents, warranties of components, delivery notes, changes of orders and other relevant documents.
- Control and Monitoring Software and manuals.
- OM Schedule with procedures and remedial instructions.
- Logistics, transport & installation equipment plan.
- Hand tools required for installation.
- H&S Guidelines for logistics, equipment manipulation and installation.

The aggregation of the above listed plans and drawings or "Engineering Package", is considered a deliverable or milestone, subject to a deadline.

Complete list or "Procurement Package", with full contact details of all suppliers, intermediaries, agents, freighters, contractors and any other party employed by awardee or related to the implementation of the project, for which an adequate confidentiality agreement will be provided by Tetra Tech. This list is considered a deliverable or milestone and subject to a deadline.

As procurement is performed by awardee, proof of order placement and payment to suppliers or service providers, as well as updated delivery schedule shall be submitted to Tetra Tech for filing and project tracking. Adequate confidentiality agreement will be provided by Tetra Tech.

Project Milestones.

The below list shows the relevant project milestones and deliverables, as well as the expected deadline for their delivery. The deadlines will be revised with the awardee once the EPC Master Plan has been provided.

#	Item	Deadline	TPC %
1	EPC Master Plan & Engineering Package	8 weeks	
2	Procurement Package	4 weeks	
3	Procurement Contracting Completion & Delivery Plan	12 weeks	
4	Mobilization on Site, after known delivery dates	3 weeks	15%
5	Completion of Solar Pv installation before HV	4 weeks	10%
6	Completion of AC/LV Section to HV Transfo, inclusive of weather station, auxiliary power, Solar system and cold testing.	1 week	
7	Completion of HV Section to Recloser, inclusive of telecom, software and testing.	1 week	20%
8	Completion of Hot Testing & Commissioning	1 week	20%
9	Training, Snagging and Remedial	2 weeks	
10	OM Supervision, Hand Over & As Built	1 week	15%
11	Continuous Operation Test (28 days)	4 weeks	20%

These deadlines are indicative and will be adjusted with the awardee according to the procurement, logistics and delivery plan.

ATTACHMENT B – DETAILED BUDGET

PROPOSED DETAILED BUDGET

The proposal shall include the below described TABLE 1, where the bidder shall reflect the total amounts equivalent to the percentages defined in TABLE 1 by adding 1 column to the defined format.

TABLE 1- Overall Budget.

Equipment/Component	Unit	Qty	Value	Total Value	% of Total
Total					

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

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.

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

(please use one box per number or dash)

3. Source and Nationality of Goods and Commodities

(i) This is to certify that the Bidder is:

a. an individual who is a citizen or legal resident of_____.

b. a corporation of partnership organized under the laws of_____.

c. 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

d. 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.

(ii) This is to certify that the **Source** (the country which a commodity is to be shipped from) of the Equipment to be supplied under this Order is(are):

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: