

## Zanzibar

### General consultant for BESS and Solar PV development

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#### 1. Introduction

The Revolutionary Government of Zanzibar, through the Zanzibar Electricity Company-ZECO (the Client), is seeking the development of a Battery Energy Storage System (BESS) and a Solar PV power plant (PV) in the island of Unguja. As a preliminary step, ZECO is selecting a General Consultant (the Consultant) to assist and accompany in preparation of the projects, from feasibility studies to construction and O&M supervision. These assets will be financed under the Zanzibar Energy Sector Transformation and Access Project (ZESTA) financed by the International Development Association (IDA) and the Clean Technology Fund (CTF).

The present document includes the Terms of Reference for the services to be provided by the Consultant throughout the process.

#### 2. Background

The Zanzibar power sector comprises three key institutions. The Ministry of Water, Energy and Minerals (MoWEM), the Zanzibar Utilities Regulatory Authority (ZURA), and the vertically integrated utility, Zanzibar Electricity Corporation (ZECO) are the main actors in the power sector. There is no independent power producer in Zanzibar. The power sector regulatory and policy frameworks continue to evolve and strengthen. The sector is governed by three key legislations: (i) the Zanzibar Electricity Corporation Act (2006) under which ZECO was established together with its key functions; (ii) the Energy Policy (2009) that lays out the long-term priorities and targets of the RGoZ for the energy sector; and (iii) the ZURA Act (2013) under which ZURA was established, together with its key functions in relation to the petroleum, water and electricity sectors. A revised Energy Policy (2021) has been drafted and is expected to be approved by the Cabinet of Ministers in the coming months.

The two main islands of Zanzibar are dependent on power imported through submarine cables from mainland -Tanzania. Unguja imports its power from TANESCO through a 39km, 132kV submarine cable with a maximum capacity of 100MW that was commissioned in March 2013. This cable was constructed following the failure of the old 132kV (45MW) oil filled submarine cable, installed in 1980, which was close to reaching its limits both in terms of capacity and economic lifetime.

Zanzibar has promising solar resources that have not yet been exploited. A preliminary feasibility study of five solar farm sites identified by the RGoZ (Micheweni, Muwambe, Matemwe, Bambi, Makunduchi) showed an average Global Horizontal Irradiation (GHI) of 2100 kWh/m<sup>2</sup>/yr, which is identified as favorable for PV applications. With a comparable GHI, the Maldives is developing a substantial solar investment pipeline.

Following these circumstances, the World Bank is expecting to approve a new project, the first ever engagement in the energy sector of Zanzibar. The proposed project will address the key priorities in of Zanzibar's power sector. These include: (i) the impending capacity constraint on the power imported from mainland Tanzania by supporting hard and soft infrastructure investments aimed at utilizing the renewable energy (RE) resources, including a publicly financed BESS and a publicly financed solar PV pilot power plant; (ii) addressing the poor supply quality and reliability of the existing electricity network, and low electricity access rate through investments in transmission/distribution network strengthening/extension and last mile household connections; and (iii) sector capacity challenges by providing technical assistance and capacity building support to strengthen sector governance and operational effectiveness.

The project will support the RGoZ in the development of the island's first grid-scale renewable energy power generation plant and battery storage infrastructure. The publicly owned solar PV plant will help meet the growing electricity demand in the near term, while paving the way for future scale-up of renewable energy, including through private sector participation. Furthermore, the project will also support the installation of a battery systems (BESS) aiming to shave off the evening demand peak and enable integration of future VRE onto the grid.

### Battery Energy Storage System (BESS)

This project will support the design, installation and initial operation of a centralized publicly owned BESS. The BESS will be connected to the ZECO grid at one of the existing or planned 132kV substations. A technical study to analyze optimal VRE integration and grid optimization for Unguja, has identified the feasibility of about 40MWh of battery storage, as a part of the least cost supply expansion plan. Detailed specifications, sizing, location, and the O&M contractual structure will be finalized during project implementation. The BESS will provide multiple benefits to the Zanzibar grid, shaving the evening peak demand, managing the variability of solar PV, and allowing greater future integration of VRE. The BESS will have two main use cases: (i) help store electricity produced by the solar PV during the day and supply energy to the grid during evening peak period; and (ii) compensate for the fluctuations inherent to solar power generation. This will allow a deferral of transmission investments (such as an additional submarine cable from the mainland) and the need to run diesel generators to serve the evening peak demand. The BESS will also reduce the impact of variable generation from the Solar PV plant on the TANESCO system, as without the BESS, TANESCO would need to provide balancing support through the

submarine cable. A stand-alone BESS will allow more flexible use of the system: it can be used for managing variability of solar, for storing energy from the mainland cable or to provide ancillary support (voltage and frequency) to the grid.

### Solar PV plant

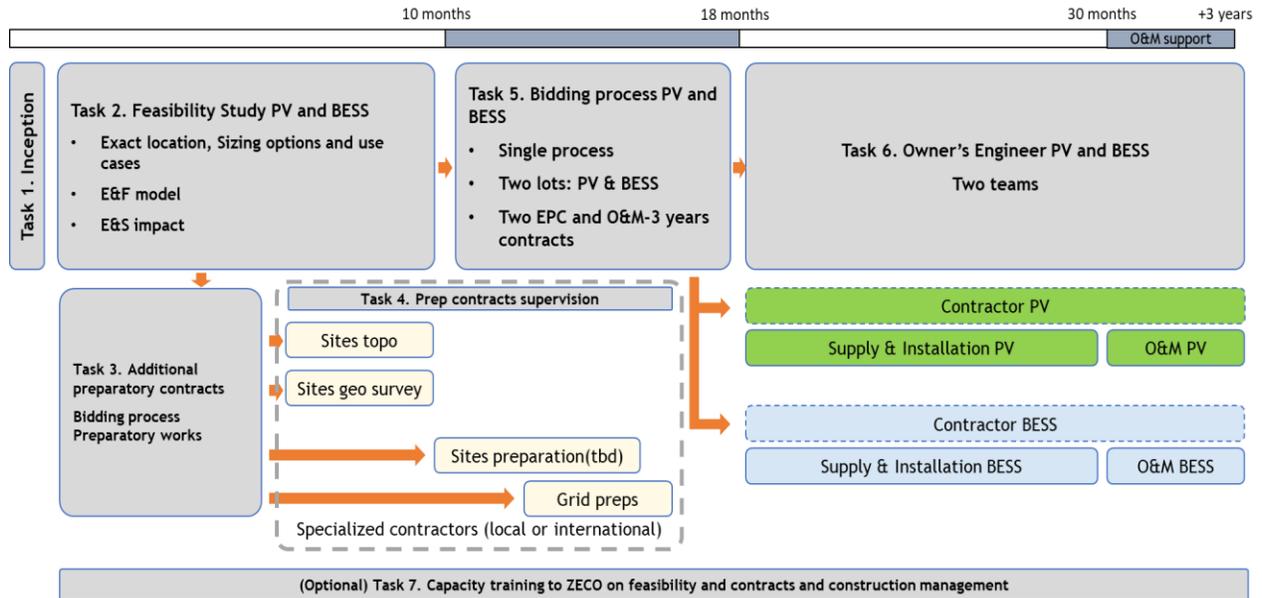
The project will finance the design, construction, and initial operation of the proposed greenfield solar PV power generation plant. The plant rating will be between 18 MWp and will be constructed in Makunduchi, at one of the three sites already identified and owned by RGoZ for RE development. The project will also support the associated civil works (land preparation, access roads, and a short interconnection line to connect the solar plant to the grid). The identified site already has good road access and the interconnection point (substation) will be constructed in proximity to the site under the project.

### 3. Objective

The objective of the assignment is to support ZECO on the full implementation of the two described components (BESS and PV plant). This assessment will include two main blocks:

- I. Tasks 1 to 5: Preparation and pre-construction works (To be implemented by Lump Sum Contract).
  - a. Feasibility studies for BESS and PV plant
  - b. Bidding process for preparatory works, including bidding documents and evaluation
  - c. Supervision of preparatory works by the selected contractors
  - d. Bidding process assistance for BESS and PV plant implementation, including bidding documents and evaluation
- II. Task 6: Owner's Engineer mission (Contract Management and Post Construction works) (To be Implemented by Time Based Contract)

The different tasks organization and the interrelation among them are depicted in Figure below



## Preliminary information

During the last two years, the firm Artelia has developed a feasibility study and power sector roadmap that includes a prefeasibility of potential sites for both, the BESS and PV solar power plant. The Consultant selected under these ToRs will be provided with that study

The feasibility studies will provide an assessment of the project using as reference the resource mapping results, the available databases, land use analysis, grid connection options and land ownership data. The studies will focus on main aspects of the project such as the adequacy of the solar resource, grid connection and construction costs, environmental and social impact, or land acquisition costs. For the solar PV plant the Consultant shall use a solar resource mapping from a reputable source in order to finalize the selection of the site.

The Consultant shall identify the optimal operation profile for BESS. The Consultant shall study the local load profile and the generation profile of existing assets and define the optimal BESS capacity accordingly. This capacity will optimize the output of the plant by minimizing the levelized cost of electricity (LCOE).

### 4. Activities to be performed by the Consultant

#### **Task 1: Project Inception and implementation planning**

This task will include the following key activities: Within 2 weeks of the contract signing, the Consultant shall carry out an Inception Mission to Zanzibar in coordination with ZECO project team. The objective of this mission should be to explain and refine the proposed methodology

and timeline, identify and meet the interested stakeholders and gather all the information required to conduct the studies. All the background documents and technical information available to the Client at project inception will be provided to the Consultant. The Consultant will be responsible for their own logistics (including getting to/from meetings and site visit locations).

## **Task 2: Feasibility studies (two separate studies) and site selections for grid connected BESS and solar PV power plant**

Based on information gathered during the inception phase, the Consultant will analyze the Zanzibar power generation and demand profile and the grid stability in the island:

- a) **Stability assessment:** The Consultant will assess the existing transmission infrastructure to understand (i) the grid ability to absorb intermittent energy and identify the most adequate location of the BESS and the PV power plant (the study by Artelia will be used as departing information).
- b) **Solar resource assessment:** The Consultant shall provide a high-resolution assessment of the solar resources in Zanzibar, focusing in the specific preselected sites (two) in search of the most promising solar potential for the application of PV plants. The assessment should utilize a minimum of ten (10) years of Global Horizontal Irradiance (GHI) data derived from second generation satellite data with 1 km x 1 km nadir resolution and auxiliary atmospheric data sets. The influence of topography on solar irradiation at the surface is to be analyzed using a digital elevation model to derive slope and azimuth maps. Moreover, the methodology applied (e.g. satellites use to retrieve data, models) as well as the related accuracy and distribution statistics have to be clearly described.
- c) **Optimal PV capacity:** The Consultant shall define an optimal capacity for a PV solar power plant (initially set at 18 MWp) to be installed. This definition will take into consideration a techno-economic analysis to minimize electricity cost while maximizing the adaptation to the country profile. A sensitivity analysis of energy generation needs vs integration capacity in the connection points would be required in order to assess the different sizes.
- d) **Optimal BESS capacity:** The Consultant shall define an optimal capacity for a BESS (initially set at 40 MWh) to be installed and the most adequate use cases. This definition will take into consideration a techno-economic analysis to minimize electricity cost while maximizing the adaptation to the country profile. A sensitivity analysis of energy storage needs with daily demand profile would be required in order to assess the different sizes.

As a minimum, the feasibility study for each asset (BESS and PV power plant) should include:

- The project site and boundary area and approximated site plan and layout.
- A conceptual design of the project, including estimation of installed capacity of PV or BESS.
- Simplified cost-benefit analysis for different technological options (to be agreed with the Client) depending on module type, mounting options (fixed vs. tracking system), and inverter type and storage technology.
- For PV plant: Estimated energy yields for a number of technologies. The energy yield should include:
  - An assessment of the inter-annual variation and yield confidence levels.
  - Consideration of site-specific factors, including soiling or snow, and the cleaning regime.
  - Shading analysis including near and far shading.
  - Electrical losses Influence of temperature variances on the efficiency of the plant
  - Global plant annual efficiency, including BESS
  - Optimal dispatching strategy
- For BESS: Estimated size in energy and power a number of technologies. The analysis will consider:
  - An assessment of the inter-annual operation of the system.
  - Consideration of site-specific factors, including ambient temperature.
  - Operation cycles and use cases
  - Electrical losses due to auxiliary and others
  - Optimal dispatching strategy
- The consultant shall determine and scope and specify the key elements of operation and maintenance (O&M) services that would need to be provided by the installation contractor to manage technology performance and related operational risks; while ZECO gains experience in O&M and builds its capacity to initiate and manage future such investments and operations. In this task, the consultant shall delineate in detail the scope of the O&M services for the two-year period following plant installation, necessary in the specific context of ZECO, to ensure efficient and reliable operational performance of assets conforming to design standards and expectations; while also strengthening ZECO capacity for the same.
- The approximate costs for development, construction and operation of the projects and predicted revenue, based on the available resource data, as well as indicative quotes or comparison with similar projects.
- The land ownership and land use status. The Client will provide the land for the project.
- Transmission line and grid connection, including cost and potential barriers to achieve grid connection.
- Economic and financial analysis for a 20-year life cycle cost - of the solar PV installation compared to existing generation mix. This analysis should also reflect the cost of connection to the grid and its maintenance costs.

- Risks assessment. The consultant shall identify all major risks associated with the grid-connected PV related to design, procurement, and operations and indicate in each case the extent of all principal risks and how and to what extent they are being mitigated via the project design developed in the feasibility study via specific features of the project design, specifications, and associated capacity building and service and maintenance services contract.
- Proposed O&M structure. The initial contract with the construction contractor will include a 2 years operation and maintenance contract to cover the defects liability period. Beyond that period, the Consultant should analyze the different options to maximize the sustainability of the asset, including a reliable mechanism of payments that provides security to a private operator and is financially feasible for ZECO. That arrangement might be pure one (O&M by ZECO or by private operator / OEM) or mixed.
- Global Environmental Benefits. The consultant shall estimate the annual carbon reduction benefits attributable to the solar PV power plant and BESS operations.
- Legal Due-Diligence. Under this task the Consultant shall conduct the following activities aimed at ensuring that the legal compliance is ensured. This shall include, but not limited to:
  - Identifying regulatory framework that needs to be complied with; approvals required; and key challenges to risk allocation.
  - Identify licensing, permitting and other legal risks that need to be addressed and allocated.
  - Identify all necessary approvals and permissions will be obtained for the selected projects before commencement of tender process, in particular to allow the relevant Government entity to sign the tender documents and contracts.
  - Permitting requirements and expected timeline and estimated costs for achieving these.
- Analysis of Environmental and Social Impacts. Conduct the assessment of social and environmental impacts of the project at the selected. This preliminary assessment must comply with the reference guidelines for the World Bank Group that will provide financing for the projects. The assessment shall include an analysis of current formal/informal land use in the project area as well as impacts associated to connecting the assets to the grid.

### **Task 3: Additional preparatory contract, including Bidding Documents and process**

During Task 2, the consultant will identify the required works to be done in the selected sites in order to prepare them for the implementation of the respective projects (BESS and PV solar plant). The consultant together with the Client will decide what preparatory works need to be done in advance and which ones can be included in the main contractors' scope without increasing the risk (hence, the price) for the main contractors. The Consultant will define the preparatory works and design a procurement and implementation strategy aiming to have the

sites ready for the main installation (closing of contract with the main contractors). Once defined the Consultant will prepare the corresponding sets of bidding documents, according to WB procurement rules, support the Client during the procurement process and prepare the Bid Evaluation Report. Finally, the Consultant will support the Client on the negotiation of the contracts.

The list of preparatory works has to be defined during feasibility stage, but a preliminary roster will include:

- Sites topographic surveys
- Sites geotechnical surveys
- Sites fencing and security
- Sites access
- Grid connections from the site to the selected connection substation

#### **Task 4: Supervision of preparatory contracts**

For each of the preparatory contracts awarded during Task 3, the consultant will perform, in collaboration with the Client, the supervision of the execution. During this execution the Consultant shall undertake the detail design review, approval of construction documents and site supervision for each of the contracts. The scope of work would be expected to include but not be limited to:

- 1) Designate a qualified supervision responsible to ensure quality and performance by the appointed contractors on site.
  - a) Assist the Client on assessment and approval of the sub-contractors, which contractors may engage.
  - b) Carry out and follow up planning activities.
  - c) Follow of the implementation schedule for the contract.
  - d) Preparation and updating the disbursement schedules and estimate the needs for additional funds.
- 2) Review engineering design and provide comments to the contractor. The Consultant will assist the Client in all aspects regarding the implementation of the project including:
  - a) Check and approve detailed designs prepared and submitted by Contractor, prior to commencement of any construction work.
  - b) Review and recommend for approval, the contractor's schedules or revisions.
  - c) Facilitate issuance of all information, notices, and instructions to the contractor by the Client as provided for in the contract documents.

- d) Undertake site supervision to countercheck execution quality, adherence to time schedule and quantity utilization as per invoice submitted status as reported.
  - e) Certify the achievement of the contractual milestones, and the satisfactory quality of the progress, in line with the progress milestones laid down in the contracts.
  - f) Provide assistance to Client in exercising strict financial control vis a vis physical progress.
  - g) Check and approve “as built drawings”, ensuring that all changes introduced in the field during construction have been incorporated.
  - h) Supervise the full and effective implementation of the Contractors’ Environmental and Social Management Plan (ESMP) if required.
- 3) Provide contracts advance reports as required and keep the Client punctually informed about all developments of the different contracts, including advance, deviations, and any other event.
- a) Verify the baseline contract indicators and monitor and support the Client to measure those indicators.
  - b) Review and verify received contractors’ invoices and variation orders.
  - c) Examine and make recommendations on all claims from the contractors for time extension, extra compensations, extra work or expenses or other similar matters including determination of new rates when required.
  - d) Propose and present for approval of the Client changes in the technical documents that may be deemed necessary for the completion of works.
  - e) Inform the Client on problems or potential problems which may arise in connection with the implementation of the contract and make recommendations to the Client for possible solutions.
  - f) Furnish timely assistance and direction to the contractors in all matters related to interpretation of the contract documents, testing and other matters related to contract compliance and progress of the project.
  - g) Contract/works or goods acceptance and close of contract, issuance of completion certificates, stating date, or dates from which the defect liability period shall commence, and preparation of documents as required for acceptance of works by the Client.
  - h) In the event of contractual disputes, assist the Client in collating and preparing factual documentation and recommend a line of actions. If required by the Client, the Consultants will attend hearings.

### **Task 5: Bidding Documents and process**

The consultant will prepare two sets of bidding documents, one for the BESS and another for the PV solar power plant. Initially, a single process with two lots may take place in order to fast track the process. In such case, many of the sections of the bidding documents (WB guidelines) will be

used but it will still require in any case, two complete, separate and individual Client's Requirements will be required for each asset: one for the BESS and one for the solar PV power plant.

This task will include the following key activities:

- Prepare analysis and recommendation on the possible bidding models and procedures to be used (e.g. bidding on tariff, bidding on cost, combined bidding for several sites, etc.)
- Prepare minimum functional specifications and tender documents for each of the assets, eligibility and appraisal and evaluation criteria and assist the Client in the tender process. Bidding documents will be prepared following latest World Bank procurement guidelines.
- The Consultant shall define the project in a manner that will attract the maximum interest from the manufacturers in the global market to get very competitive prices during bidding process.
- The Consultant should carefully deduce all the financial parameters and costs needed for decision making of investors and review the financial models that was carried out as part of the feasibility studies.
- As part of this Task, the Consultant shall design a complete procurement plan and process, based on applicable procurement guidelines and requirements, including:
  - Advice on mechanisms to maximize competition while avoiding unrealistic bids and project vulnerability from overly aggressive bidding;
  - Reviewing information to be provided by the Government to bidders to manage liabilities;
  - Design of pre-qualification package;
  - Design of key aspects of the tender procedure, for example deciding whether and to what extent to accept variant and non-conforming bids, how many bidders must bid before the process is valid, what rules to set in relation to the assessment of bids (scoring regimes, timing of bids and rejecting of excessively low bids) and how to maximize competition without sacrificing quality of bids;
  - Outlining tender documentation;
  - Outlining the contracts (including all annexes) that implements the chosen structural approach:
    - Applying the risk matrix developed during the Feasibility Study, but updated to address all project issues and market context.
    - Developing and implementing a detailed financial model and developing the contracts to fit the requirements of the model.
    - All advice compliant with applicable law and considering any constraints or opportunities associated with applicable law.
- The bidding methodology should be designed according to the Client and the WB.
- Utilizing the evaluation criteria and corresponding weights agreed with the Client, the Consultant shall evaluate the responses to the RFQ and develop numeric scores for each respondent, culminating in a numerical ranking for all submittals.
- Design of bid evaluation criteria and bid process design: The Consultant shall:

- Set up a fair, transparent, non-discriminatory and objective bid evaluation procedure and evaluation criteria;
- Design a transparent and non-discriminatory bid process that will ensure comparable bids;
- Devise effective systems for transparent communications with bidders; and
- Inspire market confidence.
- Preparation of the Request for proposals (RFP): The Consultant shall prepare an RFP document in accordance with World Bank guidelines, best industry practice and applicable laws and regulations, consistent with the results of the feasibility study. The RFP must concisely set out:
  - the output specifications of the Government;
  - requirements for compliant bids;
  - a risk profile as established in the feasibility study;
  - the payment mechanism;
  - the bid process;
  - evaluation criteria; and
  - bidder communication systems.

During the bidding process the Consultant will provide the following services:

- **Administration of the bidding process:** The Consultant shall provide all necessary administrative support to the Client for the efficient and professional management of the bidding process. This includes managing a data room and other dissemination of project data to bidders, facilitating structured engagement between the Client and bidders, helping the Client communicate effectively with bidders, including responding to bidder queries, managing bidder conferences and responding to communications with bidders to manage Government liabilities, and receiving bids.
- **Evaluation of bids:** The authorized staff of the Client, supported by the Consultant, must evaluate the bids and elaborate draft and final Bid Evaluation Reports.
- **Assistance to the Client on the signing of the contracts with the selected bidders.** These will include two separate contracts, one for the BESS and one for the PV solar power plant, that can be awarded to different contractors or to the same one, depending on the results of the bidding process.

#### **Task 6: Pre Construction, Construction and Post Construction Works (Defects Liability Period) (Time Based Contract)**

For preconstruction period for each asset (before *Note To Proceed* is issued to the respective contractor), the services to be provided will include two main activities:

- 1) Review Basic design of the plant (BESS or PV). The Consultant shall perform, but not limited to, the following activities:
  - a) Prepare the inception report proposing proper procedures for monitoring and evaluation.
- 2) Prepare construction schedule and management plan. The Consultant will be responsible in consultation with and on behalf of the Client for reviewing the construction schedule and management plan provided by the contractor. This activity will include specific tasks:
  - a) Facilitate pre-construction meeting with the contractor and Client to discuss and finalize contractor's work program for implementation of the project, reporting procedures, supplying of materials and equipment and program for quality control and testing of materials.
  - b) Together with the Client prepare guidelines for workers' safety measures for adherence to by the contractor.
  - c) Integrate the overall engineering for projects implemented by the Client for the purpose of coordinating the planning of engineering activities and interfaces of different contractors, including management of engineering changes.

During construction and post construction phases the Consultant shall undertake the detail design review, approval of construction documents, site supervision and O&M supervision for each of the assets. This phase will be divided in two sub-phases: construction and O&M. The scope of work would be expected to include but not be limited to:

- 1) Establish a site project execution team during construction and commissioning to ensure quality and performance by the appointed contractors on site.
  - a) Assist the Client on assessment and approval of the sub-contractors, which the main contractor may engage.
  - b) Carry out project management planning activities:
  - c) Follow of the implementation schedule for the project and estimate implementation periods and costs for the individual and overall packages/lots.
  - d) Preparation and updating the disbursement schedules and estimate the needs for additional funds.
- 2) Review detailed engineering and provides comments to the contractor. The Consultant will assist the Client in all aspects regarding the implementation of the project including:
  - a) Check and approve detailed designs prepared and submitted by Contractor, prior to commencement of any construction work. The Client will provide the specifications (if available) of equipment, which the Consultant will review and update if necessary, in line with international best practices. In this context, the Consultant may have to update/carry out necessary system studies, to confirm technical specifications of equipment in line with the best international standards.

- b) Prepare a project monitoring scheme (which will include technical, physical, and financial details), and finalize formats for reporting progress of Supply and Installation works and procedures for following up, supplying materials and equipment for installation in accordance with the technical specifications.
  - c) Review and recommend for approval, the contractor's supply and installation schedules or revisions.
  - d) Facilitate issuance of all information, notices, and instructions to the contractor by the Client as provided for in the contract documents.
  - e) Carry out inspection of material at the manufacturers' works as per approved drawings and technical specifications as per the Contract.
  - f) Undertake site supervision to countercheck project quality, adherence to time schedule and quantity utilization as per invoice submitted status as reported.
  - g) Certify the achievement of the contractual milestones, and the satisfactory quality of the progress, in line with the progress milestones laid down in the contract.
  - h) Provide assistance to Client in exercising strict financial control vis a vis physical progress.
  - i) Witness, supervise and approve factory inspection and testing of plant and equipment of the project.
  - j) Check and approve "as built drawings", ensuring that all changes introduced in the field during construction have been incorporated.
  - k) Supervise the full and effective implementation of the Contractors' Environmental and Social Management Plan (ESMP).
- 3) Conduct quality reviews on the project documents and coordinate with the Client to attend Factory Acceptance Tests (FAT) and Site Acceptance Tests (SAT) for the critical equipment. The Consultant will assist the Client in quality assurance and quality control of contractors works, supplies, supervise and assist the Client in required works for safe operation during construction.
- 4) Provide project advance reports as required and keep the Client punctually informed about all developments of the project, including advance, deviations, and any other event.
- a) Verify the baseline project indicators, in the Project Implementation Plan, and monitor and support the Client to measure the indicators at the project midterm review and completion.
  - b) Review and verify received contractors' invoices and variation orders.
  - c) Examine and make recommendations on all claims from the contractors for time extension, extra compensations, extra work or expenses or other similar matters including determination of new rates when required.
  - d) Propose and present for approval of the Client changes in the technical documents that may be deemed necessary for the completion of works.
  - e) Inform the Client on problems or potential problems which may arise in connection with the implementation of the contract and make recommendations to the Client for possible solutions.

- f) Furnish timely assistance and direction to the contractors in all matters related to interpretation of the contract documents, testing and other matters related to contract compliance and progress of the project.
  - g) Compile systematic records of the contractor's site activities, prepare and maintain inspection and engineering report and records to adequately document the progress and performance of the work.
  - h) Review and approve all Contractor's working drawings and perform verification of all works.
  - i) Prepare and submit to the Client the detailed monthly and quarterly progress reports and any other reports according to the Client's requirements for the works.
  - j) Carry out final inspection at the conclusion of the supply and installation contract.
  - k) Contract/works or goods acceptance and close of contract, issuance of completion certificates, stating date, or dates from which the defect liability period of supply and installation work shall commence, and preparation of documents as required for acceptance of works/goods by the Client.
  - l) Review of operation, maintenance and management manuals for the facilities constructed under the project prepared by contractors.
  - m) In the event of contractual disputes, assist the Client in collating and preparing factual documentation and recommend a line of actions. If required by the Client, the Consultants will attend hearings.
- 5) Supervise the O&M activities from Provisional Acceptance up to Final Acceptance (estimated in one year). The Consultant shall perform the following tasks:
- a) Assist and advise the Client with regard to any matter that may be subject to adjudication, arbitration, inquiry or litigation up to delivery certificate of completion.
  - b) Maintain detail records of relevant events & activities, drawings & documents, minutes of meetings.
  - c) Prepare and submit to the Client the project completion report.
  - d) Assist the Client on the eventually works' defects and issue the final acceptance certificates.
  - e) Supervise the performance of the plant according to the contractual documents.

#### **Task 7: Training Program for ZECO on construction and contract management**

The consultant shall assess the training and capacity strengthening needs of ZECO personnel to be associated with the development of BESS and solar power plants, including contract and construction management, operations and front-line maintenance of BESS and PV solar power plants.

#### **5. Deliverables and reporting**

During the different tasks the Consultant will issue at least the following deliverables for each of the assets (BESS and PV solar plant):

- **Task 1. Inception report:** The Consultant should deliver a detailed report on implementation plans for all tasks and confirm the timing and planning of the task components with the Client.
- **Task 2. Feasibility Study:** The Feasibility Study Reports, comprising all the analysis carried out under tasks 2, must be compiled in a single report in Word format (with relevant annexes), and delivered as both electronic and hard copy documents. All financial models must be in Excel format, and must clearly set out all assumptions; sensitivity analyses carried out; and model outputs. The Feasibility Study must be presented with a thorough executive summary and must be accompanied by a PowerPoint presentation that encapsulates all the key features of the study. The executive summary and PowerPoint presentation must be compiled in such a manner that they can be used by the senior government officials for decision-making purposes.
- **Task 2. Environmental and Social Impact Study.** The Assessment shall be carried out following the World Bank Policies as well as local environmental legislation and regulations. The objective of the assessment is to ensure that projects financed by the World Bank are environmentally and socially sustainable, and that the decision-making process is improved through an appropriate analysis of the actions including potential environmental and social impacts. It must be compiled in a report in Word format (with relevant annexes) and delivered as both electronic and hard copy documents.
- **Task 3. Bidding documents for preparatory contracts** according to World Bank procurement rules (output from task 4) and ensuring compliance with the local procurement rules
- **Task 3. Bid Evaluation Reports (BER) for each preparatory contract.** In accordance with the World Bank procedures and policies, the Consultant shall be responsible for preparing the appraisal report with recommendations for successful bidders to the Client for approval. The BERs are expected to be submitted within the time indicated above and as indicated by the project implementation schedule. It must be compiled in a single report in Word format (with relevant annexes), and delivered as both electronic and hard copy documents.
- **Task 5. Bidding document for BESS and PV solar plant** according to World Bank procurement rules (output from task 4) and ensuring compliance with the local procurement rules
- **Task 5. Bid evaluation reports for BESS and PV solar plant.** In accordance with the World Bank procedures and policies, the Consultant shall be responsible for preparing the appraisal report with recommendations for successful bidders to the Client for approval. The BERs are expected to be submitted within the time indicated above and as indicated by the project implementation schedule. It must be compiled in a single report in Word format (with relevant annexes), and delivered as both electronic and hard copy documents.
- **Task 4 and 6.** All documents required for supporting the construction supervision.

## Periodical reporting

The Consultant shall issue periodical reports to the Client in order to inform about the works development and incidences. After the inception report, the Consultant will issue monthly reports that will outline the Consultant's works within the period, the advance of the works, the deliverables issues in the period, the staff workload and an update of the project Gantt schedule.

### 6. Minimum Qualifications of the firm and the Key Staff

#### A. Core Business and year in Business

The consultant shall be a firm of proven experience in the design and construction of the solar PV Generation Plant and Battery Energy Storage System (BESS)

#### B. Relevant similar experience, which should specifically include the below:

The firm should have at least ten (10) years of experience in power plant design and construction including plant design and construction including five years' site experience of solar power plant construction and Battery Energy Storage System (BESS). The firm should have good experience on PV standards and proven experience on resource assessment and calculation of energy yield for solar PV projects. Experience in at least one (1) developing country with similar conditions like Tanzania

#### C. Technical and Managerial capability of the firm in the areas of:

(i) PV Plant and BESS design and installation and construction supervision, (ii) BESS standards and proven experience on BESS use cases, BESS warranties and performance and O&M, (iii) Grid stability analysis and renewable integration planning, (iv) assessment and management of environmental and social safeguards for the infrastructure and energy projects; and (v) project and contract management.

For Task 1 to 5 (Lump sum proposal):

Specialist	Requirements
Project Director	At least Master's Degree in major engineering disciplines (civil, mechanical, electrical, electronic) together with a Master's Degree in Economics, Business or Finance. The Project Director should have at least fifteen years of experience in power plant design and construction including five years site experience of solar power plant construction. He/she shall have experience working with IFIs financed projects. The Project Director will lead and manage the Feasibility Study team. It is

Specialist	Requirements
	possible that the Project Director's role could be combined with one of the roles of Engineers in the team within the Feasibility Study Team.
Solar PV expert	At least Master's Degree in a related Engineering specialization with a minimum of ten years of experience in the solar PV sector including at least five years of experience in PV power plant development covering design, procurement or construction. The solar expert should have good command of PV standards and proven experience on resource assessment and calculation of energy yield for solar PV projects.
BESS expert	At least Master's Degree in a related Engineering specialization with a minimum of five years of experience in the battery storage sector including development covering design, procurement or construction. The solar expert should have good command of BESS standards and proven experience on BESS use cases, BESS warranties and performance and O&M.
Electrical Engineer	At least Master's Degree in a related Engineering specialization with a minimum of ten years of experience in the solar generation sector. The electrical engineer should have good command of PV and storage technologies and standards and proven experience on grid stability analysis and renewable integration planning.
Civil Engineer	At least a Master's Degree in civil engineering from a recognized university. Overall experience of 10 years with 5 years' experience in design of generation projects of the same nature, size and complexity compared to this assignment. The Civil Engineer shall have experience on at least two similar projects. S/he should have experience in similar projects in Sub Saharan Countries would be an advantage.
Environmental and Social Specialist	<p>At least Master's Degree in Natural Science; at least eight years of relevant work experience in environmental assessment of infrastructure and energy projects. Good command of International standards, including World Bank safeguard policies, is also required.</p> <p>The Consultant team will need to make available a social specialist if some of the proposed sites are in private or community-owned lands, or if proposed government-owned lands are being privately used.</p>
Financial Analyst	At least a Master's Degree in Finance, Business or Economics together with at least five years of experience developing and analyzing financial models utilizing non-recourse financial structures for power generation

Specialist	Requirements
	facilities, together with tariff analysis. The Financial Analyst/s should demonstrate experience of having prepared financial models for at least three private sector financings in the power sector (ideally thermal), using non-recourse project finance.
Procurement Specialist	At least a Master’s Degree in Economics, Business or Finance, with demonstrated experience of at least five years in procurement best practice and World Bank requirements for international project procurement. The Procurement Specialist shall provide guidance and support to the Client to ensure compliance with applicable procurement requirements, and shall assist the Financial Advisory team in designing and implementing a bidding and evaluation process that meets applicable standards of fairness and transparency.

For Task 6 (Time Based proposal):

Specialist	Requirements
Project Director	At least Master’s Degree in major engineering disciplines (civil, mechanical, electrical, electronic) together with a Master’s Degree in Economics, Business or Finance. The Project Director should have at least fifteen years of experience in power plant design and construction including five years site experience of solar power plant construction. He/she shall have experience working with IFIs financed projects. The Project Director will lead and manage the Feasibility Study team. It is possible that the Project Director’s role could be combined with one of the roles of Civil Engineer, Mechanical Engineer or Electrical/Electronic Engineer within the Feasibility Study Team. This may provide an overall cost saving, but the Project Director would be required to be on site in Zanzibar during the site commitment period to carry out the engineering discipline work together with providing overall direction to the Feasibility Study.
Solar PV expert	At least Master’s Degree in a related Engineering specialization with a minimum of ten years of experience in the solar PV sector including at least five years of experience in PV power plant development covering design, procurement or construction. The solar expert should have good command of PV standards and proven experience on resource assessment and calculation of energy yield for solar PV projects.

Specialist	Requirements
BESS expert	At least Master’s Degree in a related Engineering specialization with a minimum of five years of experience in the battery storage sector including development covering design, procurement or construction. The solar expert should have good command of BESS standards and proven experience on BESS use cases, BESS warranties and performance and O&M.
Electrical Engineer	At least Master’s Degree in a related Engineering specialization with a minimum of ten years of experience in the solar generation sector. The electrical engineer should have good command of PV and storage technologies and standards and proven experience on grid stability analysis and renewable integration planning.
Civil Engineer	At least a Master’s Degree in civil engineering from a recognized university. Overall experience of 10 years with 5 years’ experience in design of generation projects of the same nature, size and complexity compared to this assignment. The Civil Engineer shall have experience on at least two similar projects. S/he should have experience in similar projects in Sub Saharan Countries would be an advantage.
Electrical Site Engineers (2)	<p>The Electrical Site Engineers shall be graduated electrical engineers with not less than 10 years of experience of installation, testing &amp; commissioning supervision of EHV transmission line and substations.</p> <p>The Electrical Site Engineers shall be responsible for overseeing the contractors’ daily site activities regarding installation, testing &amp; commissioning of BESS and PV, ensure the accuracy, timing, proper methodology, quality control of the works.</p> <p>The Electrical Site Engineers are expected to prove to have completed at least 2 (two) projects of turnkey contracts, supervising works related to similar contracts.</p> <p>It is expected one of the site engineer has an installation and commissioning experience on similar facilities</p> <p>The Electrical Site Engineers must be full time resident in Zanzibar at the respective sites during the whole construction phase of the projects, in order to ensure full time supervision.</p>

<b>Specialist</b>	<b>Requirements</b>
Environmental and Social Specialist	At least Master’s Degree in Natural Science; at least eight years of relevant work experience in environmental assessment of infrastructure and energy projects. Good command of International standards, including World Bank safeguard policies, is also required.  The Consultant team will need to make available a social specialist if some of the proposed sites are in private or community-owned lands, or if proposed government-owned lands are being privately used.
Contract management Specialist	At least a Master’s Degree in Economics, Business or Finance, with demonstrated experience of at least five years in contract management in international projects. The Contract management Specialist shall provide guidance and support to the Client to ensure compliance with applicable contracts, and shall assist the Client on financial progress meeting applicable standards of fairness and transparency.

The attention of interested Consultants is drawn to paragraph 3.14,3.16,3.17, 3.18 of the World Bank's Procurement Regulations Nov 2020 (Fourth Edition), setting forth the World Bank's policy on conflict of interest and unfair competitive advantage. Firm intending to submit expression of interest should not have conflict of interest and unfair competitive advantage as per Bank's Procurement Regulations.

### **Person-Month Estimate**

The total minimum estimate of person-months by the Client has been made and the allocated man-month by the Consultant shall not be less than the Client’s estimated person-months. However, the consultant, based on the complexity of each activity and understanding of the required services to be rendered, shall propose an adequate person – month above the Client’s minimum required person-month for any of key staff and the total person-month.

Minimum number of persons – months per phase (just indicative levels):

<b>No</b>	<b>Tasks</b>	<b>Key Staff (Person-Months)</b>	<b>Type of contract</b>
<b>1</b>	<b>Tasks 1 to 5</b>	<b>25</b>	<b>Lump sum</b>
	Project Director	6	
	Solar PV expert	3	
	BESS expert	3	
	Electrical Engineer	3	

	Civil Engineer	3	
	Environmental and Social Specialist	3	
	Financial Analyst	1	
	Procurement Specialist	3	
<b>2</b>	<b>Task 6</b>	<b>57</b>	<b>Time – based</b>
	Project Director	10	
	Solar PV expert	3	
	BESS expert	3	
	Electrical Engineer	3	
	Civil Engineer	2	
	Electrical Site Engineers (2)	12+8	
	Environmental and Social Specialist	12	
	Contract management Specialist	4	

## 7. Project time schedule

The Client has envisaged a general project schedule but the final one will be subject to the development of different processes with public entities. Therefore, the time schedule included in this section is only for information purposes to allow the Consultant to perform its estimation. However, in case of extension of timelines due to any potential delay, the Consultant would not be entitled to claim for any compensation or extension on its fees, beyond the actualizations rates that may be granted by the Contract.

The initial general schedule is:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	36 months
Task 1: Project Inception and implementation planning	◆																														
Task 2: Feasibility studies																															
Task 3: Additional preparatory contract																															
Task 4: Supervision of preparatory contracts																															
Task 5: Bidding Documents and process																															
Task 6: Pre Construction, Construction and Post Construction Works																															
BESS Construction and Commissioning																															
BESS O&M																															
PV solar plant Construction and Commissioning																															
PV solar plant O&M																															
Task 7: Training Program for ZECO (Optional)																															

## 8. Documentation format requirements

The Consultant shall deliver all data, drawings, and documents generated in the Consultants designed system of choice to the Client in the following public domain formats:

- Data: the Consultant shall supply spread sheets in Excel (Office 2013 compatible format).
- Drawings: drawings shall be delivered in digital format DWG (version 2012 or later). These deliverables shall contain sufficient graphical detail, engineering intelligence, and be of

proper configuration to allow the list specified in the data deliverables to be digitally extracted. In addition drawing list shall be delivered in Excel format that contains the following fields: drawing name, drawing type and such other data as the Client may require.

- Documents: documents shall be delivered in electronic format (MSOffice 2013 compatible files).