Energia para Moçambique

Reference No.: MZ-FUNAE-158152-CS-QCBS

TERMS OF REFERENCE FOR

FEASIBILITY STUDIES AND DRAFT PROJECTS FOR 11 PHOTOVOLTAIC MINI-GRIDS IN MOZAMBIQUE

Maputo, April of 2020

Contents

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1. PROJECT CONCEPT

BASIC PROJECT INFORMATION		
1.1	Client:	FUNAE - Fundo de Energia
1.2	Title	ProEnergia – Mozambique Energy for All Project
1.3	Objective	Increase access to energy services in rural Villages
1.4	Beneficiary	Rural villages in Mozambique
1.5	Implementing Organization	FUNAE- Fundo de Energia
1.6	Organization Type	Public Institution
1.7	Financing	World Bank
1.8	Brief description of the project	FUNAE has identified 11 potential mini-grid sites across several districts inMozambique to be supplied through combined solar PV and storage.
1.9	Brief description of the Consultancy Service	The consultancy services shall conduct the feasibility studies anddraftprojects for solar PV mini grids in the selected sites. The services shall include advisory services to FUNAE in the selection of the contractors for the mini grids.

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2. INTRODUCTION

The Government of Mozambique has taken the leadership in defining a new model for electrification, namely, National Electrification Strategy (NES), while preserving the financial viability of the sector, in order to accelerate electrification and achieve universal access by 2030.

The NES has attracted the attention and interest from other development partners to finance the first phase of the implementation strategy with around $152M, including $80M in grant from IDA.

ProEnergia will be implemented by two strategic players namely **EDM - Electricidade de Moçambique**, the national power utility whose role is to expand the National Grid for densification and **FUNAE - Fundo de Energia**whose roleis the provision of electricity services for rural areas and community centers by the implementation of mini-grids.

The Project will support the expansion of access to peri-urban and rural areas by harnessing and extending existing grid network and by piloting mini-grids in off-grid area based on solar power generation. The Project will support three (3) components that aims at connecting on-grid and off-grid households based on a sustainable approach to electrification that incorporates proven international experience, technical assistance and capacity building support.

The off-grid component will focus on supporting the electrification of areas where electricity supply through mini-grids represents the least-cost option from a country perspective. Depending on the number of users to be supplied and the service level defined for each type of user (households, enterprises, community facilities, etc.) the generation system of each specific mini-grid will be solar PV and storage.

Mini-grids will be developed under a public-private partnership (PPP) whereby: (i) independent power producers (IPPs) will invest, operate and

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maintain generation facilities of each mini-grid under power purchase agreements (PPAs) with EDM; and (ii) the distribution network and service connections will be public investments financed by the project. FUNAE will contract the design and construction of all components of the mini-grids and supervise implementation activities. Once the mini-grid is commissioned, all electricity consumers supplied through mini-grids will be EDM customers. In order to ensure quality of service meets applicable standards, EDM will outsource the operation and maintenance of network assets and retail services to qualified private contractors through O&M contracts. The IPPs and the O&M contracts will be competitively selected.

The present document brings the ToR's (Terms of Reference) aiming to hire consultancy services to conduct feasibility studies anddraft projects for solar PV mini grids in the 11 selected sites. The consultancy services shall also include technical assistance for the selection of the contractors.

3. OBJECTIVES OF THE CONSULTANCY SERVICES

3.1. General Objective

Conduct feasibility studies anddraftprojects for11 PV mini grids aiming to select and prioritize projects to be implemented with the IPP's, under the ProEnergia project.

3.2. Specifics Objectives

- Carry out site surveys in order to identify the potential for the mini grids, based on the demand profiles, needed services, potential users, estimated load demand, productive use, etc.
- Validate the sites selected according to the Mozambique Geospatial Options Analysis platform, namely the REM (Reference Electrification Model).
- Define the level of service and establish preliminary design of the mini grids generation capacity and power distribution grid (lines).

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- Define the appropriate technology and the general specifications of the main equipment.
- Provide recommendations to FUNAE on good practices for the implementation of the mini grids (construction and operation phases).
- Prepare project cost estimates, including generation and distribution costs
- Prepare draft bidding documents following the applicable World Bank's standard procurement documents and regulations.
- Assist FUNAE in the preparation of responses to requests for clarifications submitted by participants in the procurement process, evaluation of the bids received as well as in pre-award discussions with bidders selected for contract award, required by FUNAE.

4. PROJECT SITES

The project will be implemented in 11 villages, as shown in the table below (table 1).

The consultant shall review and validate the project sites according the Mozambique Geospatial Options Analysis platform, namely the REM (Reference Electrification Model).

Table 1. Project sites

#	Province	District	Admin Post	Geographical Coordinates	
1	Niassa	Majune	Muaquia	36.847401	-13.41207
2	Niassa	Mecula	Matondovela	37.002529	-12.080098
3	Niassa	Lago	Meluluca	34.7752	-12.8829
4	Niassa	Mandimba	Lissiete	35.6248	-14.2483
5	Niassa	Mecula	Gomba	38.0552	-11.7173
6	Nampula	Memba	Lúrio	40.503605	-13.535923

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7	Tete	Zumbo	Muze	31.238152	-15.065727
8	Tete	Mágoe	Chinthopo	30.576708	-15.856257
9	Sofala	Machanga	Divinhe	34.792667	-20.703056
10	Manica	Tambara	Bazua	34.178078	-17.248365
11	Manica	Macossa	Nguawala	33.603222	-18.412628

5. SCOPE OFSERVICES

The consultancy services under this ToR's shall include, but not necessarily be limited to the following:

(i) Review preliminary data available provided by FUNAE to assess the appropriate technology and installed capacity of generation plants for each site;

(ii) Carry out site visits to collect all the relevant information necessary for the good outputs;

(iii) Review the safeguards instruments available for the project and recommend measures to ensure social and environmental safeguards compliance;

(iv) Conduct the feasibility studies for each mini grid, taking into account the existing tools, such as NES and the REM and prioritize its execution;

(v) Prepare preliminary design for the power generation plants and the distribution grids, including general technical specifications of the materials and equipment involved, sizing, costing, and technical standards specifications, among other relevant aspects;

(vi) Propose arrangements to structure and package the projects, including definition of functional specifications, outputs and

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efficiency commitments expected from the generation plants, project development arrangements, and appropriate mechanismsfor payments and flow of funds to contractors, among others as applicable and relevant;

(vii) Prepare bidding documents for the generation system (PPA with IPP) and distribution network components of the project and assist FUNAE in the selection of the contractors.

6. TASKS

The consultant shall implement the following tasks (but not be limited to):

6.1. Task 1 - INCEPTION MISSION

The consultant will conduct an inception mission within 2 weeks of contract award to meet with key stakeholders, discuss and reach agreement with the FUNAE on the feasibility studies and documents to be prepared. It is expected that the projects will be isolated renewables mini-grids (solar PV) with storage. No connection with the national grid is expectedin the initial phases, but the mini-grids shall be designed considering future grid connectivity (same technical standards applied to distribution networks connected to national grid).

The consultant will assess data/information requirements and availability, reach agreement on key issues to be addressed, and prepare the detailed work plan and schedule in accordance with the proposed approach and obtain no objection from FUNAE.The consultant will issue an Inception Mission report one week after completing the inception mission.

6.2. Task 2–DEFINITION OF FUNDAMENTAL PRINCIPLES AND PRELIMINARY ASSESSMENT

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The consultant will advise FUNAE on the key fundamental arrangements of the projects, which will guide the overall consulting engagement, including, but not limited to:

- Energy demand of the proposed locations, appropriate technology sizes and output of generation plants for each site based on site survey.
- Preliminary designs and general technical reports for each of the sites.
- Preliminary environmental and social impact assessments.
- Projects development milestone dates.
- Fundamental structure of all contracts(PPAs, network O&M) such as term, project development arrangements, structure, etc.
- Key project risks and proposed allocation in the PPA and network O&M contracts.
- Conditions/requirements which potential investors may seek if they are to invest in these projects and appropriate recommendations.

6.3. Task 3 – SITE VISITS AND DATACOLLECTION

The consultant will review available information to determine the adequacy and credibility of data and determine additional information that would need to be verified through site investigations and surveys, based on results from the tasks 1 and 2. Consultants willneed to visit the site to collect data and to determine additional investigations that might be needed. The data collection plan would be amended as necessary.

The visit will providethe consultant team an opportunity to verify the actual characteristics of the specific sites, including geography and proposed layout of generation site, site access and key environmental characteristics, village/load centre location and characteristics, household density, number of public service centres and their location, number of outlying customers, and potential productive applications that could be stimulated by the provision of electricity. The consultant will develop a preliminary plan for the project and discuss the findings and recommendation with FUNAE.

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6.4. TASK 4 - FEASIBILITY STUDIES

6.4.1. Assess the market opportunity in 11 defined sites

The consultancy will:

- Collect technical and socio-economic data related to the study area;
- Mapping the market opportunities in each defined site identifying potential users (housing, public facilities, small businesses and others) and demand profiles for the mini-grids;
- Determine the projected energy consumption and energy demand;
- Present the economic and social viability analysis, including:
-
    - Cost of electricity production and costs of connection to the consumer;
    - Establish the cost of investment, operation and maintenance based at least cost;

6.4.2. Conduct a survey of willingness and ability to pay in order to indicate the appropriate approach for energy services access

The consultancy will:

- Determine the cost, revenues and expenditure on electricity;
- Identify challenges with power supply and their dependence on alternative sources;
- Evaluate potential or communities willingness to be a part of the project;
- Evaluate potential and willingness to use the power for productivity use in the communities.

6.4.3. Conduct the feasibility studies for the 11sites

The consultancy will:

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- Indicate and describe the suitable technology for each site in order to achieve the sustainable energy services;
- Identify the location for potential productive use centre's within the project areas;
- Determination of the proposed installed capacity of the generation component of the mini-grid, and determination of the amounts of additional physical works for the different components required to operate each site, based on the outcomes of the previous activities.
- Size the projects, define the level of service for each site and determine the preliminary design of the mini-grids;
- Summarize the economic and social viability analysis; and
- Elaborate the business model suitable for National Electrification Strategy.

6.5. Task 5–DRAFT TECHNICAL AND BIDDINGDOCUMENTS

The consultant willprepare thetechnical relevant documents and support FUNAE in the preparation of bidding documents for the project packages including all items in scope for bids, in full accordance with applicable World Bank standard procurement documents The documents shall be separated in generation package and distribution grid package, and will contain all information needed for implementation under engineering-procurement-construction (EPC) scheme,as following:

- Descriptive memories for the intended projects;
- General technical specifications of the materials and the main equipment;
- Drawings and the electrical distribution grid profile; and
- Bill of Quantities.

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The mini grids distribution lines shall be in accordance with the new standards provided by EDM.

The bidding documents shall also include the preliminary designs report and technical specification for each site. Applicable requirements for environmental and social impact assessments should be specified.

The documents shall also include the bidder'srequirements and the pre-qualification criteria and procedure to conduct the bidding process and recommend how FUNEA should conduct the bidding process.

6.6. Tasks 6 -ASSISTANCE DURING BIDDING PROCESS

The consultant will also to assist FUNAE in conducting the Bids, site visits if it's necessary, responding to bidders request for clarifications, evaluation of the bids, and preparation of evaluation report.The Bids process can be elaborated in two segments, namely power generation plant based on small IPP development and distribution networks based on public investment, assuming the recommendations raised from task 6.4.

6.7. Task 7 – CLOSING MISSION

The consultant shall conduct a conclusion of the services with a presentation of all the findings and address recommendations to FUNAE, what have to include the way forward for the good implementations of the mini grids, under the ProEnergia Programme.

7. EXPECTED OUTCOMES AND DELIVERABLES

Deliverable	Due Date from Contract Award
1. Inception Report	One month
2.Preliminary Report, what include	Three months

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fundamental aspects of the project, general technical considerations, environmental and social assessment	
3. Feasibility study for the 11 mini grids, including Least-cost electrification analysis	Four Months
4. Draft projects for the mini grids, what includes descriptive memories, drawings and technical specifications	FiveMonths
5. Bidding Documents for the construction and supervision	Six months
6. Closing report	Eight months

8. REPORTING, COORDINATION AND CONSULTATIONS

The Consultant should closely coordinate with FUNAE in the conduct of each task. FUNAE will facilitate coordination of the consultant with other agencies whenever it is necessary, such as EDM, ARENE, and other consulting teams as necessary for the success of this assignment.

9. REQUIRED KEY PERSONNEL

- Lead Advisor – economist, social or financial specialist with ruraldistribution systems and knowledge of renewable energy generation a minimum of ten (10) years relevant experience. Successful completion of feasibility studies of similar types of projects would be important. Experience in Rural Electrification in Africa, at least 5 similar projects and 4 recommendation letters would be an advantage. An MBA or an advanced relevant degree is required.

- SPV Specialist – minimum seven (10) years relevant experience, with expertise in renewable generation systems, in particular solar generation with battery storage system. The Engineer should be

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registered with a recognized professional engineering body and have a minimum of BSc (Engineering) in electrical or related field.

- System Engineer – minimum seven (7) years relevant experience, with expertise in rural distribution systems and costing, and knowledge of renewable generation systems, in particular solar generation with storage. The Engineer should be registered with a recognized professional engineering body and have a minimum of BSc (Engineering) in electrical or related field.

10. LANGUAGE

All the deliverables under these services must be separately in Englishand Portuguese.

11. DURATION OF THE CONTRACT

The present contract is expected to have a duration of **12(twelve) months**.

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