Terms of Reference

Project Reference: SAP ID: 130012; Grant No.: 2000002862

Project Title: Promoting investments in small to medium scale renewable energy technologies in the electricity sector of Guinea Bissau

Statement of Work: Consulting services related to the development of the energy baseline, tariff scheme, management and operation model and capacity building programme for a solar PV mini-grid hybrid project (500 kWp), in Bissorá (Guinea Bissau)

Starting Date: As soon as possible

1. Country/ Region

Guinea Bissau, city of Bissorã (12º13'31.37''N; 15º27'01.48''W)

2. Background

The GEF Project (ID 5331) entitled "Promoting investments in small to medium scale renewable energy technologies in the electricity sector of Guinea-Bissau" is executed by the United Nations Industrial Development Organization (UNIDO) in close partnership with the Ministry of Energy and Industry of Guinea Bissau, the ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE) and the Small Island Sustainable Energy and Climate Resilience Organization (SIDS DOCK).

Through combined interventions in the areas of technology demonstration, policy advisory, knowledge management and capacity development, the project aims at the creation of an enabling environment for renewable energy investments. The project foresees the development and installation of a set of renewable energy projects with a total electric capacity of 2.5 MW. Besides other technologies, particular emphasis has been given to innovative medium-scale PV mini-grid hybrid systems (between 300 to 500 kWp) for rural electrification and productive uses.

In this context, UNIDO, the West African Economic and Monetary Union (WAEMU/UEMOA) and the African Biofuel and Renewable Energy Company (ABREC-SABER) are partnering on the construction of a solar PV hybrid mini-grid for the city of Bissorã with a total installed electric capacity of 500 kWp. The company Prosolia Africa has been contracted to undertake the required civil works and turn-key installation of the power station. The civil works are already in an advanced stage and will be completed within July 2017. The power station is expected to be installed by the end of 2017 and will be followed by grid and household connection works.

The city of Bissorã is a peri-urban area and an important administrative centre of the Oio region, located in the north of Guinea-Bissau (Fig. 1 below). According to a preliminary survey, Bissorã presents economic dynamism, thanks to its administrative role. The town has a population of around 10,358 inhabitants (1,150 households, with an average household size of 9 inhabitants/household), approx. 160 small commercial businesses, 2 small hotels, 1 hospital, 10 schools, 1 police station, 4 administrative offices, a youth centre, as well as 4 mosques and 4 churches.

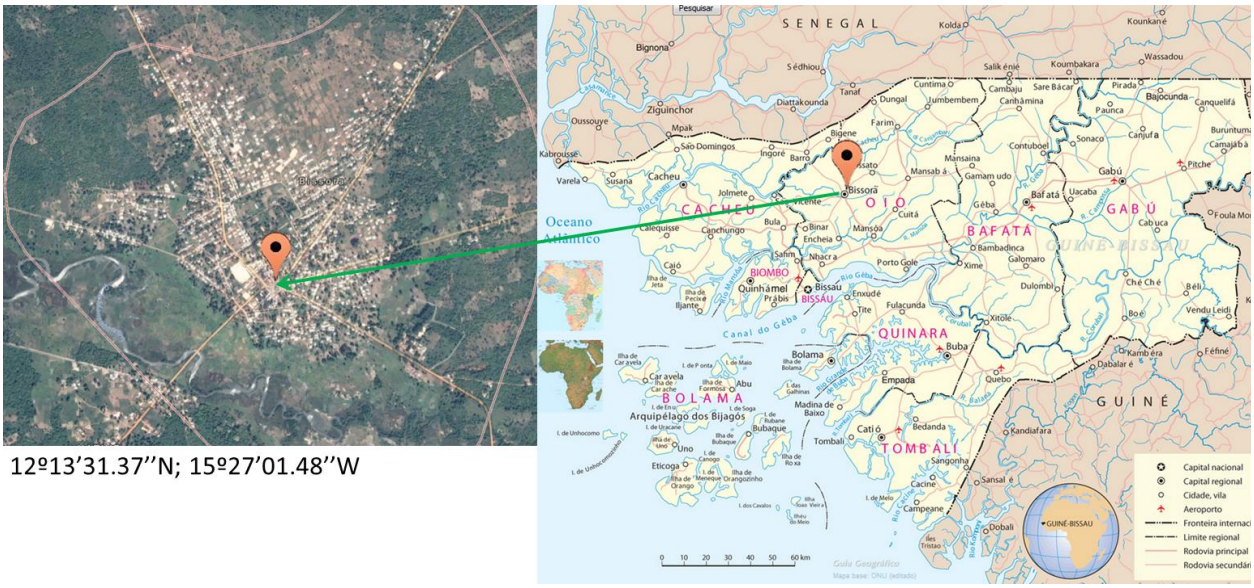

Figure 1: Geographic location of Bissorã, (Sources: Africatourism.com and Google Earth)

The mini-grid in Bissorã is a replication project of the PV hybrid mini-grid project for *Bambadinca Sta Claro*. It is operating since 2015 and has an installed electric capacity of 312 kWp. The project was implemented by TESE Sem Fronteiras in partnership with the Associação Comunitária de Desenvolvimento de Bambadinca (ACDB), with financial and technical support of the European Union (EU), UNIDO and the Camões – Instituto da Cooperação e da Língua. The Bissorã project will benefit from the lessons learned of the *Bambadinca Sta Claro* project which has adopted a community based operation and management model.

3. Objective of the Assignment

To ensure the long-term sustainability of the Bissorã project, the partners are seeking consulting support for the development of the energy baseline, tariff setting scheme, management and operation model and a capacity building program.

4. Scope of Work and Deliverables

The assignment includes the following five key tasks and deliverables:

1. Develop **an energy baseline narrative report and an xls tool** for the city of Bissorã. These should provide reliable technical and socio-economic knowledge, including a data base for the selection of the tariff scheme, as well as the management and operation model of the PV mini-grid hybrid system.

2. A **tariff setting report, tool and manual** will be produced. The report will recommend a feasible tariff structure and collection model for the project.

3. Based on broad stakeholder consultations and international best practice an effective and efficient **management and operation model and manual** will be developed. It will be based on a strong business model.

4. On the basis of the selected management model and the capacities of the operator, the contractor will develop a **capacity building program document** (incl. budget and result framework)[1]. The objective of the program is to systematically prepare the operator in the hand-over and first year of operation.

5. In the course of the assignment the contractor will **conduct three training workshops** on the energy baseline report and tool, the tariff setting and management report, tool and manual, as well as the management and operation model and manual. The target audience will be the operator, as well as other stakeholders in Guinea Bissau and ECOWAS. The workshop costs (with the exception of the working time and travel costs of the contractor) will be covered separately by UNIDO (e.g. logistics, workshop room).

Specifically, the assignment has the following scope:

[1] This assignment does not include the execution of the capacity building program.

Tasks	Deliverables	Indicative working days (w/d) as orientation	
		Int. Consultant(s)	Local Consultant(s) in GB
1. **Inception meeting and report**	D.1.1: **Inception report approved by UNIDO** (incl. detailed activity plan, time schedule, list of key literature and stakeholders, schedule of stakeholder workshops and meetings, assessment questionnaire(s), tables of contents of the energy baseline report, tariff setting report and capacity building program document, as well as outline of the xls based tools);	2	2
2. The contractor develops **a narrative energy baseline report, and an xls tool for the city of Bissorã**, which provide a sound technical and socio-economic knowledge base for the selection of the tariff scheme and setting, connection policy as well as the management and operational model of the mini-grid. The baseline report will incorporate a standardised xls based tool that can also be used for other cases. The analysis of the final report will provide data on the current energy system, costs, infrastructure (incl. GPS based map), type of clients (e.g. households, companies, institutions) and energy uses, energy supply and demand patterns and trends. The consultant will make use of existing socio-economic data of the available (pre-)feasibility studies and other mini-grid projects in Guinea Bissau and ECOWAS. The final baseline assessment report will include graphs, editable xls tool and GPS based planning maps. The consultant will propose an effective and efficient methodology for the data collection and	D.2.1: Narrative energy baseline report, accompanied by an xls tool for the city of Bissorã in Portuguese (shall be provided by the contractor in editable format, fully edited an ready for publication) D.2.2: Documentation of workshops and raw data	15	25

analysis (e.g. household energy survey and questionnaire, usage of existing statistical socio-economic data, workshops).			
3. **A tariff setting report, tool and manual** will be produced. The report will recommend a feasible tariff structure and collection model for the project. It shall take the following aspects into account: a.) the life-cycle financial sustainability requirements of the project (e.g. replacement costs), b.) the ability and willingness of the population to pay, c.) the tariff level of grid electricity and similar PV hybrid mini-grids (such as in *Bambadinca*). The consultant will propose an effective tariff collection model (e.g. prepaid meters) and will involve project beneficiaries, target group representatives and local authorities in the discussions. The consultant will calculate the recommended tariff structure with a standardised xls based tool which takes the live-cycle costs and projected revenues of the project into account. A manual for the usage of the tool will be included and provided to the future operator. The tariff setting will be based on the collected data of the energy baseline report. Moreover, it will include the following steps and elements: • Assessment of existing policy, legal and regulatory framework for mini-grids and lessons learned from the *Bambadinca Sta Claro* mini-grid hybrid project; • Assessment of the existing tariff structure in Guinea Bissau (on-grids/off-grid); • Identify available tariff scheme options (e.g. flat, power based, pre-paid based, service based); • Selection of the best scheme in partnership with	D.3.1: Report on Tariff Setting in English and Portuguese D.3.2: Tariff Setting Tool in English and Portuguese D.3.3: Tariff Setting Manual in English and Portuguese (All documents must be provided by the contractor in editable format, fully edited and ready for publication)	10	10

the Government, local authorities and population; involve the local population from the very beginning; take in consideration the tariff scheme in *Bambadinca Sta Claro;* • Identify available tariff options based on the existing and projected load profile, connection rates, financial parameters, the clients profile (residential/commercial,) and the estimated operating and replacement costs of the plant; • Select the best tariff structure in partnership with the Government, local authorities and population; • Present the tariff to the local population a public workshop organized by the Government; The contractor must present an effective and efficient implementation methodology, based on state of the art methodologies and reflecting Guinea-Bissau's reality.			
4. Based on broad stakeholder consultations, international best practice and various alternatives, the contractor will **propose an effective management and operation model** which takes as much as possible local ownership into account. The model shall guarantee that procedures and competencies are well defined in four dimensions: i) financial and commercial management; ii) system operation and maintenance; iii) system surveillance and security; and, iv) conflict prevention and resolution. It will cover all relevant business, technical, financial, and socio-economic aspects to ensure long-term sustainability of the mini-grid system. The contractor will do a comparative analysis between various business models for stand-alone mini-grid systems (i.e. community based, utility based, private based, or a hybrid model). The activity will include the	D.4.1: Mini-grid management and operation model (in English and Portuguese) D.4.2: Mini-grid management and operation manual (in English and Portuguese) (All documents must be provided by the contractor in editable format, fully edited and ready for publication)	10	10

development of an **operation and maintenance (O&M) manual** to be used by the future operator. The contractor will take the lessons learned of the community based management model of the mini-grid hybrid project *Bambadinca Sta Claro* into account. Finally, the contractor will assist the Government in the selection of the operator.			
5. Based on the management model and depending on the capacities of the selected operator, the contractor will develop a **tailored capacity building program** proposal (incl. budget and result framework). The objective of the program is to systematically assist the operator in the hand-over and the first year of operation. **Note**: This assignment does not include the execution of the capacity building program.	D.5.1: Project document on the capacity building program (in Portuguese) (All documents must be provided by the contractor in editable format, fully edited and ready for publication)	5	5
6. During the assignment the contractor will **conduct three training workshops** on the energy baseline report and tool, the tariff setting and management report, tool and manual, as well as the management and operation model and manual. The target audience will be the selected operator, as well as other key stakeholders in Guinea Bissau and ECOWAS region. The workshop costs (except the working time of the contractor) will be covered separately by UNIDO (e.g. logistics, workshop room, etc.).	D.6.1: Training materials in editable format and photo documentation	8	8
	TOTAL INDICATIVE WORK DAYS	**50 w/d**	**60 w/d**

5. Time-Frame

The deliverables of the assignment shall be provided within a period of **six (6) months** after the effectiveness of the contract. The tight installation and commissioning schedule for the power station and mini-grid requires strict time discipline of the contractor. In case of installation delays, UNIDO and the contractor can agree on an extension of the contract duration (without budget increase).

Deliverables	Months					
	1	2	3	4	5	6
Deliverable 1 – Inception Report						
Deliverable 2 – Baseline report and tool						
Deliverable 3 – Tariff setting report, tool and manual						
Deliverable 4 – Management and operation model and manual						
Deliverable 5 – Capacity building program document						
Deliverable 6 – Trainings						

6. Reporting and Coordination

The contractor reports to the UNIDO project manager and coordinates closely with the focal point in the Ministry of Energy and Industry, WAEMU/UEMOA, ABREC-SABER, ECREEE, as well as Prosolia Africa. The contractor will provide all prepared files, raw data and undertaken calculations to UNIDO and the counterpart (e.g., docx, pptx, xlsx, jpeg, etc.). In addition, the consultant will be required to deliver the following to the partners:

•	Item	**Minimum 50 high-resolution photographs (at least 3 MB each)** – that illustrate the undertaken activities. The consultants will cede all appertaining rights to unlimited use of the respective pictures to UNIDO and the counterpart.	**At latest until the end of the assignment**

7. Qualification and Evaluation Criteria

QUALIFICATION REQUIREMENTS
Profile of the consultancy Consultant's Team • Registered consulting company with at least five (5) years of public and private consulting experience in the area of sustainable energy. • The tight time schedule of the project requires immediate availability of the contractor; • Project team demonstrates strong academic background in energy technologies, energy economics, as well as renewable energy; at least one of the experts obtains a relevant Master Degree in energy engineering.

- Project team with a sound track-record of at least five (5) years of consulting experience in renewable energy, particularly with regard to the development and implementation renewable energy demonstration and investment projects.
- Project team with previous involvement in similar assignments and methodologies related to the planning and implementation of renewable energy powered (hybrid) mini-grids (e.g. household energy surveys, tariff setting, feasibility studies, implementation) in Sub Sahara Africa; experience in Guinea Bissau is a strong added value.
- The nature of the assignment requires the employment of domestic experts in Guinea Bissau (e.g. data gathering, coordination).
- The team demonstrates excellent communication and intercultural skills;
- Strong problem solving, communication, research and outstanding analytical writing skills, with a proven ability to write analytical reports and develop operational manuals.
- Project team as a whole shall be fluent in English and Portuguese (French is an added value). The working languages for the assignment will be English and Portuguese.
- Availability throughout the whole consultancy service period, to regularly engage in *Skype* meetings with the core team and relevant partners.

8. Application Procedure

Applicants shall submit their written proposals in English or Portuguese in the following form:

- Technical proposal (including proposed approach and methodology, work plan, detailed CVs of international and local experts, copies of university degrees, certifications, licenses, proven track record of similar implemented assignments, as well as produced documents of previous mini-grid assignments).
- Financial proposal in $USD (including all costs and taxes, as well as a detailed work-time-expert-diagram indicating daily rates for individual team members).

Applicants are requested to submit their proposals no later than **18:00 hrs (CEST) of July 24th, 2017**, by registering on the UNIDO procurement system (www.unido.org/procurement). In case of difficulties, submissions could exceptionally be sent to procurement@unido.org, by providing an objective and convincing explanation for doing so.

9. Further information

- http://www.unido.org
- http://www.ecreee.org/news/ecreee-and-unido-support-new-government-guinea-bissau-reaching-sustainable-energy-all-se4all
- http://www.thegef.org/gef/project_detail?projID=5331
- http://www.saber-abrec.org/
- http://www.ecowrex.org
  Info related to Bambadinca[2]: Renewable energy-based mini-grids: the UNIDO experience
- Creation of renewable energy-based mini-grid industries in Guinea-Bissau - EN

[2] Pls. refer to Chapter 3.3. *"A participatory approach for mini-grid development in Guinea Bissau"*, (pp. 42-48).