



REPUBLIC OF KENYA

MINISTRY OF ENERGY

TERMS OF REFERENCE

FOR

THE PROCUREMENT OF CONSULTANCY SERVICES FOR EXPLORATION OF OPTIONS FOR PRODUCTIVE USE AND DEMAND CREATION FOR SOLAR ENERGY FOR MINIGRIDS, BOREHOLES AND STAND ALONE SYSTEMS; AND COOKSTOVES IN UNDERSERVED COUNTIES FOR KENYA-OFF GRID SOLAR ACCESS PROJECT (K-OSAP)-

**PROJECT ID: P160009
PROJECT REF. NO: KE-MOE-102190-CS-QCBS**

TERMS OF REFERENCE (TOR)FOR PROCUREMENT OF CONSULTANCY SERVICES FOR EXPLORATION OF OPTIONS FOR PRODUCTIVE USE AND DEMAND CREATION FOR SOLAR ENERGY FOR MINIGRIDS, BOREHOLES AND STAND ALONE SYSTEMS; AND COOKSTOVES IN UNDERSERVED COUNTIES FOR THE KENYA OFF-GRID SOLAR ACCESS PROJECT

Background

The Ministry of Energy (MoE) is coordinating the implementation of a \$150 million project to enable marginalized communities in Kenya to access modern energy services through off-grid solar and cookstoves. In full alignment with the Kenya National Electrification Strategy, the World Bank-funded Kenya Off-Grid Solar Access Project (KOSAP) will serve an estimated 1.3 million people in 277,000 households in 14 underserved counties. It will reach homes, businesses, and community facilities via mini-grids and stand-alone solar systems, using practical business models that attract private sector investment, knowledge, sustainable services and other key efficiencies. Further, in line with the Sustainable Energy for All Action Agenda for Kenya that seeks to provide all Kenyans with access to modern energy services for cooking by the year 2030, 150,000 cookstoves will be deployed in 8 underserved counties.

The Project will support four components that are aimed at:

- i. Component 1 - Electrification of households, public facilities and businesses through mini-grid systems; (250,000 households are targeted and at least 140 minigrid sites are envisaged)
- ii. Component 2 - Electrification of households through standalone solar systems and provision of Clean Cooking Solutions for households. This component has two sub components: Sub Component 2A - Standalone Solar Systems for households and Sub Component 2B- Clean Cooking Solutions for Households (HH); (at least 250,000 households are targeted for solar systems installation)
- iii. Component 3 - Electrification of community facilities through standalone solar systems and Solar Water pumps for communities; (425 community facilities are targeted)
- iv. Component 4 - Technical Assistance, including institutional development, capacity building and project implementation support.

The project area will be split into six service territories based on geographic proximity and to optimize the costs of field operations (Figure 1).

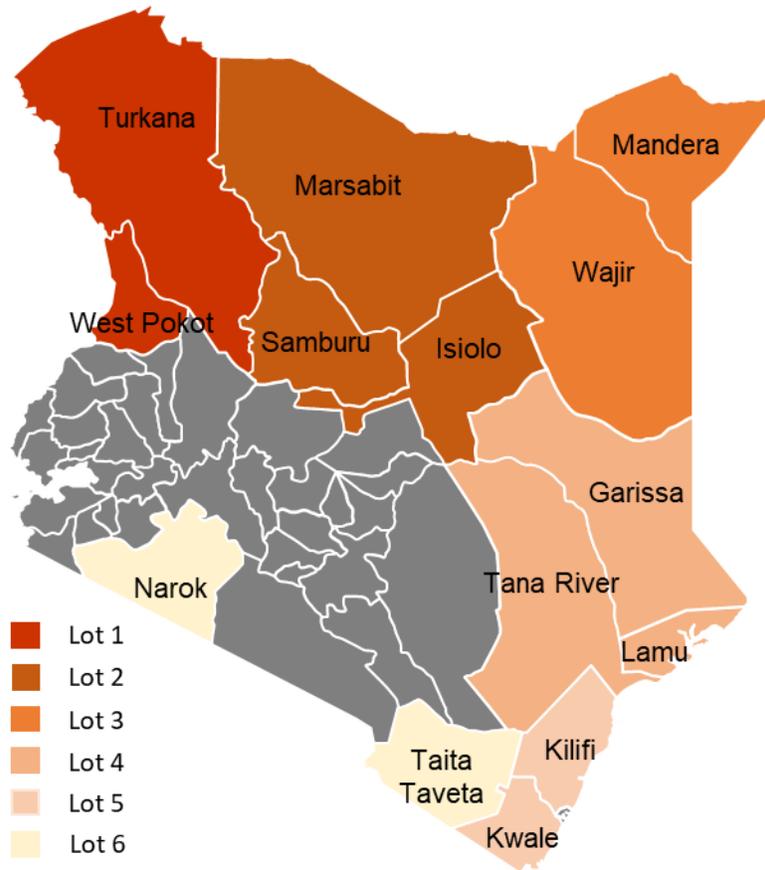


Figure 1. KOSAP Target Counties and Service Territories/Lots

Productive Uses of Energy (PUE)

Kenya receives solar insolation of 4-6 kWh/m² owing to the fact that the country lies astride on the equator. The immense solar resource makes solar PV mini grids, solar powered water pumps and stand-alone solar systems a cost-effective solution for electricity generation in these underserved counties.

The mini-grids in KOSAP will be developed under a public-private partnership (PPP) whereby private investment and public funds co-finance construction of generation facilities, and public funding is used to construct the distribution network. All electricity consumers supplied through mini-grids will be KPLC customers and pay the same tariff for each category charged to users connected to the national grid, ensuring effective implementation of a national uniform tariff policy. In the case of stand-alone solar systems, community facilities will be identified for solar system installation. A private sector entity will be contracted to design and install the systems for the schools, hospitals and county administration offices. Through KOSAP, boreholes will be identified for solar water pump installation. Thereafter, private entities will be contracted to carry out the works. The 150,000 stoves that will be deployed through KOSAP will be sold to households.

One of the key challenges for the various solar installations will be the creation of sufficient demand from the customers in the project areas i.e. using the electricity for other uses apart from

lighting or water for domestic use in the case of boreholes. There is need to use the electricity generated for income generating activities (Productive use of Energy – PUE) resulting in poverty reduction. Likewise the stoves should be fully exploited as a potential source of income generation. Productive use of energy includes all the direct energy inputs into employment, income generation and wealth creation activities resulting in a positive outcome. Some examples of productive use are the use of cook stoves for baking bread for sale and electricity for agricultural activities and off farm small and micro enterprises such as maize milling. Catalyzing PUE often requires extra measures to overcome barriers such as a gap in skills, awareness or financial resources. These terms of reference set out the tasks expected of a consulting firm/consortium who will explore options to stimulate demand for, and encourage productive use of, the energy services that will be provided through KOSAP’s interventions in the underserved counties.

Objectives

The main objective of this assignment is to assess the market for minigrids, stand alone solar systems, solar powered boreholes and Cookstoves sites so as to identify and recommend interventions that will promote PUE. Productive use of Cookstoves shall also be explored. This will include design and testing of energy service “prototypes” that can unlock latent business potential of the communities residing in off-grid areas.

Scope of Work

The key activities that will be undertaken are summarized as follows:

I. *Identify major productive uses and sectors*

The consultant will conduct a high-level (quantitative) assessment to identify major productive uses in key economic sectors, and regions of interest in context of the objective – promoting demand for energy for productive uses in the project territories. For this, he/she will review relevant information and studies such as the minigrid, boreholes investigation, stand alone solar system survey reports, and consult with key government officials, private sector and donor stakeholders for this assessment. The consultant will also conduct consultations with the communities to establish their interest in utilizing the energy resources for productive use. Appropriate consultative methods should be employed with the aim of obtaining information on the energy requirements of the community with respect to productive use. The consultant should assess productive uses of energy activities undertaken by women. This will ensure that women who access work, energy, capital and own assets differently from men will be addressed sufficiently. Women’s energy requirements also differ from men’s. At the end of this assessment it is envisaged that the consultant will have information on the potential uses of energy in the project territories. During the submission of the inception report, the consultant will need to agree with the KOSAP Project Coordinator, the stakeholders to be consulted and the approach for identifying the PUE uses and sectors.

II. *Prioritise areas of investigation*

The consultant will identify potential areas for carrying out a detailed market study. For this he/she will review relevant information and existing studies, and consult with key government officials, development partners, and with private sector entities active with strong interest in off-grid renewable energy, particularly for productive uses, in Kenya. During the submission of the inception report, the consultant will propose and need to receive agreement from Project Coordinator, the stakeholders to be consulted and the approach for identifying the sites.

At least 2 high potential sites in each county in terms of perceived size of energy demand, business viability and demand growth potential will need to be identified for detailed market study.

III. *Field visits and data collection for project sizing/business case*

For the identified high potential sites, the consultant will design and conduct field surveys to collect necessary data/information required for sizing and characterizing projects. The tools for collecting data shall be validated by the Project Co-ordinator to ensure all aspects of PUE are captured. This could include, but is not limited to:

- Information on energy services type (productive uses) demand and technology characteristics (e.g. electric milling for agro-processing, number of mills etc.)
- Data/information to quantify share of energy cost in production, including type and (unit) price of fuel; sourcing/supply method of fuel.
- Data/information on business expansion potential and future profitability.
- Data/information to assess if fuel replacement and/or increase in production volume would increase sales price/profit potential
- Data/information to assess future market size: current volume of raw input demand of productive use (e.g. tons of rice of milling, current electricity use (per unit) and potential changes in raw input volume e.g. changes in rice production)
- Current issues associated with production (fuel availability, cost uncertainty, local air/water/noise/land pollution, forest degradation, labour intensiveness, routes to market, etc.)
- Market maturity level and potential, current business models and governance of the productive use activities (e.g. cooperative, private mill etc.)
- Data/information to assess green jobs and impacts on gender: Approximate individuals employed per major sub-activity and approximate female employment per major sub-activity
- Data/information to assess willingness and ability to pay for electricity if switched to clean energy sources
- Data/information to assess assistance received from Govt/NGOs.
- Interventions required to improve PUE
- Evaluate current and necessary expertise to operate the various PUE enterprises

- Conduct value chain analysis for various sectors with potential for productive use
- Evaluate competitiveness
- Financial feasibility assessment
- Propose technical feasibility checklist (for installations compatibility with productive uses)
- Potential partners and alliances. E.g. for financing community equipment for productive use

IV. *Develop project business cases*

Drawing on primary data from the field and secondary sources, the consultant will produce for each site an assessment of energy demand for the identified productive uses, minimum energy price for profitability/acceptability, willingness and ability to pay, and potential renewable technologies for replacing existing fossil fuel supply and/or meeting future demand. The following should be prepared for at least 1 site per county with the highest potential for renewable energy intervention.

- High level financial appraisal/business case for bankable PUE projects. Potential business models should be described for each project.
- Provide indication and rationale for the replicability of the proposed project(s) and business models in different sites in the county within the economic sector where the productive use project belongs.
- Indicate scale of investment potential of the projects on a (sub)sector-wide basis in terms of total investment and ROI
- Provide an overview of the risks and barriers for realizing the projects (e.g. business model risk, technology risk, operational risk etc.)
- Indicate how the project will address strategic objectives of inclusive growth (positive environmental impact, poverty alleviation, gender inclusivity). Provide indicative assessments if possible.
- Highlight any impacts on the sustainable use of natural resources particularly.

For purposes of supervision the consultant shall undertake the study together with 4 counterpart staff seconded by the project proponent for each county i.e. a Chief Executive Committee Members(CECM) responsible for energy;a County Renewable Energy officers (CREO)and 2 members of the Project Co-ordination Unit (PCU). The counterpart staff will join the consultant during field visits for the public site assessment. The consultant will be expected to pay the Daily Subsistence Allowance's as per their respective job groups as approved by SRC (rates to be provided) for the counterpart staff during the field visits and provide transport cost within the county arising from their participation. This is a reimbursable cost.

Qualifications/Experience/Expertise requirements

Firms interested in this assignment should be able to demonstrate the following Competence and experience: The firm should have, as its core business segment, over seven years of experience in the renewable energy sector consultancy services, marketing and development. The firm should have completed, at least, two assignments of similar nature and complexity within the last seven years. The Consulting firm should have well established technical and managerial competence with good pool of expertise. This assignment is estimated to require about 16 key expert months while the actual key expert deployment is to be based on the consultant's technical approach and methodology. The assignment may require deployment of the following key experts, as a minimum, with specified qualifications and experiences as detailed below:

i. Renewable Energy Expert and Team Leader

- Advanced degree in a relevant field, such as energy, engineering, economics, or environmental science.
- At least 8 years of accumulated work experience in similar consulting assignments
- Strong experience and understanding of business support activities and formulating business plans in the energy sector, preferably around energy use for productive activities;
- Strong experience in conducting market sizing/assessment and energy needs assessment from a technology and project perspective. Experience of implementing renewable energy for productive use projects/assignments is a plus
- Good knowledge of energy market dynamics, key clean energy related policies/strategies and programs.
- Experience in similar developing economies and similar socioeconomic conditions with that of the client country.
- Language and communication skills: proficiency in the contract language while ability in the client country's national language or working language would be an advantage.
- Demonstrated experience on donor funded projects in developing country will be an added advantage

ii. Sociologist

- Advanced degree in sociology and community development or similar relevant education
- 8 years experience in community livelihoods projects in rural settings
- Strong experience in stakeholder engagement and management for data/information collection;
- Experience in carrying out similar surveys and assessments in a similar economy

- Language and communication skills: proficiency in the contract language while ability in the client country's national language or working language would be an advantage.
- Demonstrated experience on donor funded projects in developing country will be an added advantage

iii. Gender expert

- Advanced degree in gender studies
- 5 years experience in carrying out similar community livelihoods projects in rural settings
- Strong experience in stakeholder engagement and management for data/information collection;
- Experience in carrying out similar surveys and assessments in a similar economy
- Language and communication skills: proficiency in the contract language while ability in the client country's national language or working language would be an advantage
- Demonstrated experience on donor funded projects in developing country will be an added advantage

iv. Engineer

- Degree in electrical engineering
- 6 years experience in solar system design for productive use of energy
- Experience in promotion of cookstoves for productive use of energy
- Experience in carrying out similar surveys and assessments in a similar economy
- Language and communication skills: proficiency in the contract language while ability in the client country's national language or working language would be an advantage

v. Economist

- Degree in economics
- 5 years experience in energy projects modeling
- Strong experience and understanding of business support activities and formulating business plans in the energy sector, preferably around energy use for productive activities in off-grid areas;
- Strong experience in stakeholder engagement and management for data/information collection;
- Experience in carrying out similar surveys and assessments

- Language and communication skills: proficiency in the contract language while ability in the client country's national language or working language would be an advantage
- Demonstrated experience on donor funded projects in developing country will be an added advantage.

The table below indicates the required time input for each of the experts:

#	Expert	Time Inputs (Man Months)
i.	Team Leader(i. Renewable Energy Expert and Team Leader)	6 (spread over 6 months period)
ii.	Team Member 1(Sociologist)	4 (spread over 6 months period)
iii.	Team Member 2(Gender Expert)	4 (spread over 6 months period)
iv.	Team Member 3(Engineer)	4 (spread over 6 months period)
v.	Team Member 4(Economist)	4 (spread over 6 months period)

Reporting, Deliverables & Time Schedule

The work is expected to last at most 6 months. The consultant will work closely with the Ministry of Energy and (as needed) KPLC, REREC and EPRA to ensure that the expected results are realized during the study.

Task	Due Date (after contract start)
Inception Report presenting consultant's interpretation of the terms of reference, the technical approach to the work and allocation of duties to the team, including a time allocation schedule	2 weeks
Interim Report	12 weeks
Ministry of energy and stakeholder Workshop- One Day workshop	17 weeks
Draft Report	21 weeks
Final Report	24 weeks

Client support, counterpart and reporting arrangements:

The client will provide available project documents that may assist the consultant to have more background information to the assignment and these documents are meant for the exclusive use during the assignment. The consultant will report directly to the Project co-ordinator KOSAP who will approve reports and monitor quality of services delivered. Further the client will also provide:

- i. Introduction to County Executive Committee members on energy and County Renewable Energy Officers to facilitate on ground co-ordination
- ii. Introduction to liaison Ministry of Energy officers

Procuring Entity

The address of the procuring entity is given below:

The Principal Secretary,
Ministry of Energy
Attn: Head of Supply Chain Management Services
Postal Address: P.O. Box 30582, Nairobi, Kenya
Code: 00100
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Zip code: +254
Tel: (0)20 3310112 Ext.270
kosapmoep2017@gmail.com

Further information can be obtained from Eng. Isaac Kiva, OGW, and Secretary for Renewable Energy at isaac_kiva@yahoo.com