

# **Financial Cooperation with Uganda**

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**Get Access: Mini-grid systems in Uganda**

**Invitation for Expression of Interest  
(Pre-Qualification)  
for**

**Pre-Feasibility Study on the planned project  
“Get Access: Mini-grid systems in Uganda”**

**KfW Development Bank**

**representing**

**Rural Electrification Agency (REA) (Uganda)**

**July 2017**

**Project no.37967**

**DEADLINE: Aug 29th, 2017 16:00h  
local time Frankfurt/Germany**

## INVITATION FOR EXPRESSION OF INTEREST

As first stage of an international open bidding procedure for the consulting services required for the elaboration of a **Pre-Feasibility Study on Mini-grid systems promotion in Uganda**, KfW Development Bank, representing Rural Electrification Agency (REA) (Uganda), hereby invites qualified independent consultants to submit a prequalification document (Expression of interest). Funds for the services have been earmarked for this project and will be provided by a special fund held by the German Federal Ministry for Economic Cooperation and Development (BMZ) through KfW Development Bank. **Please note that it is intended that the Consultant of the Pre-Feasibility under this tender will be invited to submit an offer for direct award by the selected implementing agency in Uganda as employer for the future Feasibility Study.**

The expressions of interest have to be submitted and must be received not later than .....2017, at 16:00 local time at the office of the tender agent iCee GmbH, in Frankfurt/Germany. Only the submission of the set with the original hardcopy at the Tender Agent in Frankfurt is relevant for timely delivery.

All cost for obtaining information/data and preparation/submission of the prequalification document, meetings, negotiations, etc. in relation with the prequalification or the subsequent proposal shall be borne by the consultants.

The following document provides the necessary information on the required consulting services and the details on this pre-qualification procedure. At any time, KfW Development Bank either at its own initiative or in response to clarifications requested by an interested consultant may clarify this invitation. Such information will be presented on the website for this prequalification and will therefore be made available to all interested consultants:

<http://www.financial-cooperation.com/Tenders/Uganda/PQ37967.htm>

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## **Background**

Currently, about 85% of Ugandan households do not have access to grid electricity. Government of Uganda is committed to significantly raising the access rate in the country. Accordingly access to power shall be improved through extensions, stand-alone systems, as well as isolated mini-grids.

Due to the scattered nature of settlements in Uganda, mini-grids will play a major role in increasing electricity access in Uganda. Over the last decades some off-grid systems were developed in Uganda, mainly using micro-hydropower. Recently the approach gained momentum with more and more diversified (private) projects under development. However, currently less than 10 mini-grid stations are in operation, some more are under construction.

Within the Framework of German Technical Cooperation with Uganda (GIZ), MEMD, REA and ERA are working on various activities to promote the provision of renewable-energy based mini-grids system to be operated by the private sector. This includes among others the development of pilot mini-grids in two zones (through an auction tender process open for private developers to select concessionaires/licensees for the implementation and operation of mini-grids). These activities serve as a pilot project for the potential future Financial Cooperation Project, for which this Pre-Feasibility Study shall be elaborated. Consequently, these activities and the lessons to be learned will be of utmost importance for the Study under tender.

The envisaged future project of German Financial Cooperation with Uganda shall promote Public-Private Partnership Mini Grid Systems. Similar to the GET FiT program, the future mini-grid project approach in rural off-grid regions in Uganda is envisaged to combine the following three main elements: private sector investments (to leverage limited public funding and reach scale), adequate regulatory/framework conditions to reduce financial and political risk and financial instruments to make the schemes viable.

The main objective of the Project is to contribute to the cost-effective, reliable, sustainable and affordable power supply in remote rural villages and to foster efficient and sustainable use of power.

## **The Consultant Services**

The details of the requested consulting services are subject to adaption in line with the further development during this tender.

### **1.1 Objectives**

The objective of this assignment is to support MEMD and REA with the preparation of a pre-feasibility study in order to apply for financing from German Financial Cooperation for the selected approach. The Pre-FS shall, on the basis of experiences made during the GIZ-funded pilot:

1. analyze and assess whether the approach of mini-grids is generally viable in Uganda with an adequate promotional (financial) support scheme,
2. assess the various options for delivery models and propose one institutional set-up
3. determine the adequate framework conditions for the mini-grids and the involvement of the private sector;
4. determine the geographical areas generally suitable for this project

## **1.2 Outline of Overall Approach**

The envisaged future project of German Financial Cooperation with Uganda shall promote Public-Private Partnership Mini Grid Systems.

The main objective of the Project is to contribute to the cost-effective, reliable, sustainable and affordable power supply in remote rural villages and to foster efficient and sustainable use of power.

Similar to the GET FiT program, the future mini-grid project approach in rural off-grid regions in Uganda is envisaged to combine the following three main elements: private sector investments (to leverage limited public funding and reach scale), adequate regulatory/framework conditions to reduce financial and political risk and financial instruments to make the schemes viable. Thus, the project requires:

- Private initiative (to invest and) to provide the energy services;
- An adequate tariff level taking into account the affordability of the customers and the financial viability requirements of investors;
- A clear regulatory framework that addresses commercial and political risks as well as clarifies roles and responsibilities of public and private players;
- Calibrated promotional financial instruments to complement the revenue from the customers so that the projects become viable for the private operator without creating windfall profits.

The specific delivery model is open for debate. Different roles and responsibilities of public and private sector actors are possible, equally tendering options (geographic areas vs. specific sites, KPIs vs. defined installations etc.) can be explored.

## **1.3 Outline of Main Tasks of the Studies under Tender (Pre-Feasibility-Study)**

In this stage the Consultant shall analyse the GIZ-supported pilot project and compare it in SWOT to other delivery models/experiences for mini grids. Furthermore he will analyze, discuss and assess in detail the available Territorial Business Plans, which will have been presented to REA under the Master Plans Project.

Potential gaps and issues to be addressed before scaling up the pilot and/or implementing the mini-grid approaches of the Territorial Master Plans should be clearly articulated. If the approach is not deemed feasible, possible alternative approaches from the SWOT should be suggested and their suitability justified.

The Consultant team shall make use of the existing information to analyse the feasibility of these approaches in Uganda under the given conditions. In contrast to the later Feasibility Study, the Consultant of the Pre-FS is not expected to collect statistical data by visits and interviews with the target group on-site of future mini-grid locations. However, the Pre-FS may benefit from brief spot visits to existing/envisaged mini-grid sites, e.g. of the GIZ pilot project or already implemented initiatives.

Another key topic of the Pre-FS is the elaboration, discussion and proposal of the options for the delivery model and institutional set-up for future mini-grids.

Furthermore the Consultant will have to carry out an overall Environmental and Social Risk Screening for the approach and the corresponding type of mini-grids.

This phase will make mainly use of existing information and focus on discussions with key stakeholders, including interested developers from the private sector.

The results of the first stage will be presented by the Consultant in a workshop and discussed with the stakeholders and a delivery model/basic set-up of the program will be agreed upon (e.g. open programme with criteria etc.). The detailed approach will then be elaborated in a second study (Feasibility Study), tendered by the selected implementing agency. In case of satisfactory performance as well as continued financial capability and in accordance with KfW and Ugandan procurement guidelines, the consultant of the pre-feasibility study may be invited to submit an economic bid for direct award for the later feasibility study.

#### **1.4 Qualification of the Consultant and Required Expertise**

The Consultant needs to be adequately qualified for this interdisciplinary assignment, covering economic, legal and financial issues, technical details and environmental and social aspects. In particular it is required that the consultant has sufficient knowledge and experience in at least the following fields:

1. Renewable and small conventional power generation and storage technology, especially Solar PV
2. Technical planning and modelling of mini-grids
3. Operation schemes of mini-grids in the area of rural electrification
4. Economical modelling of mini-grids
5. Energy project and infrastructure financial and economic analysis

6. Experience in working with development partners and DFIs/ IFIs regarding their project evaluation and financing criteria as well as in smart subsidy schemes, especially in the energy sector.
7. Contracting of private lessees or concessionaires for similar power distribution and electrification projects
8. Knowledge of and experience in approaches and programs of German Financial Cooperation, especially promotional financial instruments such as GETFIT.
9. Environmental and Social Risk Screening and elaboration of Environmental and Social Management Frameworks (ESMF), the latter to describe how to deal with environmental and social risks&impacts in the individual projects incl. prevention, protection and compensation measures.

It will be the responsibility of the consultant to form a team according to his own assessment of the needs of the project. Consultants are free to associate themselves with other firms to ensure that all required know-how and experience are available to them.

### **1.5 Cooperation and other Special Activities**

The Consultant will cooperate closely with a group of key officers from MEMD, REA, ERA and GIZ, who will support him in the access and collection of relevant information.

The Consultant is expected to organize one workshop in Kampala with the institutions mentioned above in order to present the findings of the assignment and agree on a model to be analyzed during the feasibility study.

### **1.6 Time Frame and Duration of the Consulting Services**

The Consulting Services are expected to commence the fourth quarter of 2017 to be carried out and finished within 3 months.

## **The Tender Process for the Selection of the Consultant**

### **1.7 Overview on Tendering Procedure**

The KfW Development Bank is in charge of this selection procedure and will be the employer of the services. KfW is supported by a tender agent in this task, who will manage a website for this pre-qualification as the focal point for this tendering procedure. All communication on this project shall be via and through this website.

Funds have been earmarked for this study by the German Financial Cooperation, provided through KfW development bank.

The contract for the consulting services will be awarded in an **open international tender** to independent, qualified consultants in line with KfW's "Guidelines for the Assignment of Consultants in German Financial Cooperation with Partner Countries." The contract itself will be concluded by KfW and will follow the KfW's specimen contract for consulting services.

The choice of consultants will take place in a **two-stage procedure** with a pre-qualification followed by tender.

KfW Development Bank as hereby invites qualified independent consultants to submit a **prequalification** document for consulting services required.

At any time, KfW Development Bank either at its own initiative or in response to clarifications requested by an interested consultant may clarify this invitation. Such information will be presented on the website for this prequalification and will therefore be made available to all interested consultants:

<http://www.financial-cooperation.com/Tenders/Uganda/PQ37967.htm>

## 1.8 Conditions for Participation

This international tender is open to all independent and qualified consultants.

Consultants are **free to associate** themselves with other firms in the form of a consortium or with sub-contracting to ensure that all required know-how and experience are available to them.

Candidates, i.e. single consultants or consortia, shall have an annual minimum turnover of the equivalent of EUR 2.5 mio (average of the last three years).

If a candidate relies on a sub-consultant's or other entities' professional capacities their capacities are considered as part of the candidate's capacities.

Interested qualified consultants may be involved already in off-grid development activities in the region on behalf of Project Developers, or they may have plans to do so. Such consultants shall be allowed to participate in this tender and to carry out the consulting services as well. They shall however disclose the type of engagement and the name of the clients during the tender stage. Furthermore to assure a fair competition, the contracted consultant will be firmly committed to a policy of strict and complete and early disclosure of all such involvement with potential conflicts of interests.

## 1.9 Language

The language of this tender, all communications and the future study is English.

### 1.10 Application documents

The Applicant shall provide with its EOI all necessary information and documents according to the Checklist in Annex A.

### 1.11 Request for additional information and clarifications

Consultants are free to inform themselves. However, visits of the KfW, REA or other institutions during this pre-qualification stage are neither necessary nor welcomed.

Only written enquiries requesting clarification of this invitation for expressions of interest are permitted.

Any question, communication or request for additional information concerning this tender are only permitted in writing and **up to ten days before the deadline** for the submission of the expressions of interest. Enquiries should be addressed to tender agent as

**Email to: [Peter.Lindlein@financial-cooperation.com](mailto:Peter.Lindlein@financial-cooperation.com)**

Any other enquiries or interventions may be regarded as impermissible intervention and lead to the exclusion of the applicant.

Answers will be given in writing on the website.

For the response to inquiries the above-mentioned website will be the focal point of the tendering process. Usually, responses and clarifications will be grouped and given to the registered consultants on a regular base (e.g. weekly clarification note). However, any delay on this or any other account shall not be understood as a reason for extension of time for submission of the expressions of interest.

Discussions of the applicants on their expressions of interest with KfW and any other party involved directly in the pre-qualification are not permitted between the deadline for submission and the results of pre-qualification.

### 1.12 Procedure for Submission of Expressions of Interest

The **prequalification document** in English language shall follow the form, structure and content given in the checklist in the annex.

Interested consultants are requested to submit concise and clear, but substantial documents and to adhere to the structure. Non-compliance with this invitation or faulty information shall lead to non-qualification. Any surplus of information not specific to the material requested will be penalized.



The prequalification proposal shall consist of a **hardcopy** with an additional **softcopy** of all documents in pdf-format on a CD-ROM or USB-Stick. The pdf-files shall preferably be in a searchable format.

The expressions of interest have to be submitted and must be received not later than, **Aug 29th 2017, at 16:00 local time** at tender agent iCee GmbH, in Frankfurt/Germany. The preparation and the timely submission of the prequalification document is the responsibility of the applicant and no relief or consideration can be given for errors and omissions.

The prequalification proposal will be submitted in one set (Hardcopies: one original and one copy; plus Softcopy on a USB-stick in searchable pdf format) to the tender agent's office:

iCee GmbH  
Att. Dr. Peter Lindlein  
Schumannstrasse 49  
D 60325 Frankfurt

Only the submission of the set with the original hardcopy at the tender agent's office in Frankfurt is relevant for timely delivery.

After opening the prequalification documents until preparation of the short-list of the qualified consultants, no communication of any type shall be entertained.

### 1.13 Evaluation of Expressions of Interest

It is planned to establish a short-list of not more than five prequalified consultants within a month after the submission date and to invite technical and financial proposals from these consultants.

The evaluation procedure for the prequalification process will follow the latest version of the „Guidelines for Assignment of Consultants in Financial Co-operation Projects“.

Specific evaluation criteria and their individual weight are presented in the following table:

Criteria	Maximum Score
1. <b>Evidence of relevant experience gained by consultants during the past ten years</b> ( <i>Experience of the candidate</i> )	<b>50</b>
1.1 Experience in the technical aspects of off-grid power supply development, especially mini-grids (studies, implementation, operation; project and program level)	15
1.2 Experience in financial operation of off-grid schemes (modelling and/or implementation) and smart subsidies schemes in the energy sector such as GET FIT and pri-	15

	vate delivery models for mini grids (Studies and/or Operation)	
1.3	Experience in Public Private Partnership Projects (PPP) in the energy sector	5
1.4	Experience in Cooperation with Development Finance Institutions, especially KfW	5
1.5	Experience with working-conditions SSA, particularly in East Africa/Uganda preferably in rural electrification	10
<b>2.</b>	<b>Suitability for this specific project</b> ( <i>Experience of the available experts</i> )	<b>50</b>
2.1	Assessment of available technical and regional expertise specific to this project, listed key experts	15
2.2	Assessment of the overall personnel structure in regard to the tasks expected (coverage of tasks by key experts and additional personnel, e.g. local renewable energy experts)	15
2.3	Assessment of the key personnel in permanent employment and always available to monitor the team and provide back-up services from the home office.	10
2.4	Form of the application documents: Are they complete, concise and related to the project?	10

After having completed the evaluation of the prequalification documents, a short-list consisting of five highest ranked Consultants or less scoring a minimum of 70 points will be established. Short-listed firms will be invited to submit a technical and financial proposal; firms not pre-qualified will be informed accordingly.

#### 1.14 Others

1. The preparation and the submission of the prequalification document is the responsibility of the applicant and no relief or consideration can be given for errors and omissions.

2. KfW Development Bank is not bound to select any consultant.

**END of PQ-Note – Main Text**

**Annex:**

A. Checklist for the Prequalification Proposal

B. Declaration to observe the highest standard of ethics during execution of the contract.

C. List of project references

D. Tentative List of Experts

E. Outlook on Future Feasibility Study

F. Background Information on the Rural Electrification in Uganda

**Annex A****Checklist for the Expression of Interest**

<b>1</b>	<p><b>Covering Letter</b>, comprising</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> the legal firm name of the participant (please refrain from using alternative brand names)</li> <li><input type="checkbox"/> its legal form,</li> <li><input type="checkbox"/> address,</li> <li><input type="checkbox"/> contact person (and substitute),</li> <li><input type="checkbox"/> telephones,</li> <li><input type="checkbox"/> fax and</li> <li><input type="checkbox"/> emails</li> </ul> <p>and if applicable</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> mention the type of association for this project and</li> <li><input type="checkbox"/> naming its members,</li> <li><input type="checkbox"/> stating clearly the legal form of cooperation (e.g. consortium partner, sub-contractor) for each cooperation partner.</li> </ul>	
<b>2</b>	<p><b>Presentations of firms (maximum 10 pages), inclusive clear statements of type</b>, property and key task of and within the association, if applicable. This shall include a description of the relevant sectoral and regional experience of the company and/or its key staff.</p>	
<b>3</b>	<p><b>Statements and Declarations:</b></p>	
<b>3.1</b>	<p>Declaration of submitting a proposal in case of being short-listed;</p>	
<b>3.2</b>	<p>Declaration of submitting a proposal for the future Feasibility Study in case of being invited for direct procurement.</p>	
<b>3.3</b>	<p>Statement on <b>affiliations</b> of any kind with other firms which may present a conflict of interest in providing the envisaged services signed by all associated partners.</p>	
<b>3.4</b>	<p>In case of an <b>association</b> – the intended contractual arrangement with international and local firms, nominating the lead consultant and including letters of intent of participating firms (in case of local partners a fax copy of such letter of intent is sufficient).</p>	
<b>3.5</b>	<p><b>Declaration of Undertaking</b></p> <p>All participants in an invitation to tender for services to be financed in full or in part by KfW are required to ensure fair and transparent competition. Applicants should be aware that any fraudulent or corrupt activities disqualify them immediately from participation in the selection process and will be subject to further legal investigation.</p> <p>This is to be documented through a corresponding Declaration of Undertaking (see Annex B). The Declaration of Undertaking must be signed with legal effect by sufficiently authorised representatives of the bidder, and in the case of joint bids by all partners.</p> <p>Failure to submit this Declaration of Undertaking or to comply</p>	

	with the requirements contained in it shall lead to exclusion from the tender process.	
<b>4</b>	Presentation of copies of <b>certified financial statements</b> (Copies of balance sheet and profit and loss account of the last three years and of the auditor's opinion) of the lead consultant and all associated partners showing the necessary aggregated annual turnover of more than EUR 2.5 million.	
<b>5</b>	List of <b>project references</b> carry out as Annex C (EU-Format) covering the reference period of ten years and strictly related to the envisaged services (maximum 10 references), of which about five each should be for <ul style="list-style-type: none"> <li>□ the technical aspects of mini-grids and their planning and operation and</li> <li>□ the financial aspects and smart-subsidy schemes (such as GET-FIT) as incentives for private sector participation.</li> </ul>	
<b>6</b>	Brief <b>CVs on personnel</b> proposed for backstopping and home office support. (Max 10 CVs) with scanned or original signature of the experts	
<b>7</b>	<b>List of available personnel</b> and structure for the envisaged services, especially the key international experts, with information about education, professional experience, regional experience, years with firm, specific project-related experience and experience in similar posts. This list shall allow a profound judgement on the consultants' general ability to provide the required personnel having the specific experience for the project in case of an offer. Personal belongs to the firm or have a long cooperation gets more points.	

**Annex B****Declaration of Undertaking**

We underscore the importance of a free, fair and competitive contracting procedure that precludes abusive practices. In this respect we have neither offered nor granted directly or indirectly any inadmissible advantages to any public servant or other person nor accepted such advantages in connection with our bid, nor will we offer or grant or accept any such incentives or conditions in the present tendering process or, in the event that we are awarded the contract, in the subsequent execution of the contract. We also declare that no conflict of interest exists in the meaning of the kind described in the corresponding Guidelines.

We also underscore the importance of adhering to environmental and social standards in the implementation of the project. We undertake to comply with applicable labour laws and the Core Labour Standards of the International Labour Organization (ILO) as well as national and applicable international standards of environmental protection and health and safety standards.

We will inform our staff of their respective obligations and of their obligation to fulfil this declaration of undertaking and to obey the laws of the country of Uganda.

We also declare that our company/all members of the consortium has/have not been included in the list of sanctions of the United Nations, nor of the EU, nor of the German Government, nor in any other list of sanctions and affirm that our company/all members of the consortium will immediately inform the Client and KfW if this situation occurs at a later stage.

We acknowledge that, in the event that our company (or a member of the consortium) is added to a list of sanctions that is legally binding on the Client and/or KfW, the Client shall be entitled to exclude us/the consortium or, if the contract is awarded to our company/the consortium, to immediately cancel such contract if the statements made in the Declaration of Undertaking were objectively false or the reason for exclusion from the tender procedure occurs after the Declaration of Undertaking has been issued.

(Place) ....., this ..... day of .....

Name of company .....

Signature(s)

## Annex C

### Experience

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Please complete tables using the format below to summarize the **major relevant projects related to this project** carried out in the course of the past 10 years by the legal entity or entities making this application.

#### Overview table

No	Project Title	Name of legal entity/client	Types of Services	Country	Overall project value (EUR)	Proportion carried out by legal entity (%)	Dates
		...		...	...	...	

#### Table for individual reference

Ref No (maximum 15)	Project title ...							
Name of legal entity	Country	Overall project value (EUR)	Proportion carried out by legal entity (%)	No of staff provided	Name of client	Origin of funding	Dates (start/end)	Name of partners if any
...	...	...	...	...	...	...	...	...
Description of project						Type of services provided		
...						...		

The number of references to be provided must not exceed **10** for the entire application.





## **Annex E**

### **Outlook on Phase 2: Feasibility Study (future separate procurement)**

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Upon a positive decision on a specific approach, the stakeholders will proceed with the second stage (Feasibility and Design Study) and contract a corresponding Consultant.

Depending on the future approach and experience so far the future employer may request the submission of a proposal from the Consultant of the Pre-FS to be contracted directly for the Feasibility Study.

This future FS study shall elaborate the standards and details of a viable mini-grid approach in Uganda based on a comprehensive empirical analysis and assessment and contain all elements necessary for appraisal by KfW, e.g.

- 1) A detailed concept for the implementation of the programme, including roles and responsibilities, objectives and indicators, risks, cost and financing, tendering and implementation procedures including O&M etc.
- 2) a first list of selected adequate areas and villages for such off-grid systems,
- 3) the detailed calculation of the commercial gap (cost-revenues) to be covered by external funds under various scenarios.

In contrast to the Pre-Feasibility Study the Consultant of the FS is expected to collect substantial statistical data through extensive field visits and interviews with the target group on-site of future mini-grid locations.

## Annex F

### Background Information on the Rural Electrification in Uganda

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This background information summarizes key documents and is drafted to our best knowledge. However, as all these factors are under continuous development of various institutions, we are not liable for the accuracy of the information and data provided. It will be the responsibility of the bidder to familiarize himself with key documents and the information provided by the respective key institutions.

#### 1 Electrification Status

Based on the latest information available about 15% of Ugandans have access to grid electricity (55% in urban and 7% in rural areas). The Ministry of Energy and Mineral Development (MEMD) estimates that further 13% of the rural population have access to electricity by solar or generator power.<sup>1</sup> Nevertheless, according to this source about 618,000 urban and 4,850,000 rural household have no access to electricity at all. Closing this gap is hampered by poverty and the population trend: according to surveys about 34% of the rural population live below the poverty line and the population growth rate of 3% p.a. adds about 236,000 new rural households each year until 2030.

#### 2 Access: Plans and Strategy

According to the Rural Electrification Strategy & Plan (2012-2022 RESP)<sup>2</sup> the target rate is 26% for 2022 and access is projected to be at 51% by 2030 and 100% by 2040. The RESP will combine grid and off-grid solutions. There is no dedicated access policy. The implementation combines three approaches depending on demand and cost<sup>3</sup>:

1. **Grid extension** in areas where the demand for electricity is high and the demand justifies the cost. **On-grid electricity services** are considered the main driver to achieve universal access goals. Various donor-supported programmes are underway to extend and densify the grid and connect households and businesses. Grid extension, e.g. in the 'Energy for Rural Transformation Project' (World Bank) is in line with an Indicative Rural Electrification Master Plan (IREMP) completed by REA in 2009, which employed surveys and consultations to identify lines that would serve areas with high economic development and access potential. REA is currently working on a connection policy that aims at increasing electricity access on-grid through subsidies. This has been successful in the Output Based Aid programme for poor households (supported by EU, BMZ and World Bank) but proves to be very costly.
2. **Mini-grids** where the demand is not so high and the distance from the grid is long (at least 1km, probably minimum 3-5km) but the loads are fairly concentrated with potential for productive use of electricity such as trading cen-

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<sup>1</sup> Ministry of Energy and Mineral Development – Uganda's Sustainable Energy for All (SE4All) Initiative Action Agenda, June 2015, p.23

<sup>2</sup> The Government of the Republic of Uganda / Ministry of Energy and Mineral Development - Rural Electrification Strategy and Plan (RESP). Covering the Period 2013-2022, 2013, p. ii

<sup>3</sup> BENA, Benon (Manager, Off-Grid Renewable Energy Development, REA) - Electrification Using Renewable Energy: Uganda's Experience, Presentation 2015, Nairobi

tres including islands communities (max. 2 MW). In 2014 within the RESP the GoU and the Rural Electrification Agency (REA) discussed an approach with 141,000 additional installations of solar photovoltaic and **mini-grid** distribution service connections for off-grids until 2022.<sup>4</sup> PV powered mini grids have been suggested for targeting villages with 100-1000 households each, the smaller ones preferably in the neighbourhood of mobile communication stations.<sup>5</sup> Please note, that neither the RESP nor the SE4All address much further the role, opportunities and details of mini-grid systems, which has to be developed and/or determined through the Study under this tender, taking into account existing initiatives.

3. **PV stand-alone systems** for isolated and dispersed households, businesses and social services facilities. About 260,000 SHS systems have been sold and installed by the private sector so far. According to the SE4All document with an annual rate of 103,000-206,000 additional 1.6-3.2 m households shall have access to electricity by **SHS** (up to 3m) and other off-grid solutions by 2030<sup>6</sup>.

RESP focuses on orchestrating resources and stakeholders to operate in scaled-up service territories for which **long-term electrification service business plans** shall be developed, implemented involving the **private sector** and the beneficiary population. Uganda has in place more than nine **large donor funded programs** aimed to increase the number of connections through the expansion of transmission lines and grid densification.

Within this strategy, **isolated mini-grids** are considered to some extent an **intermediate solution** in a double sense: By size they are the element between main grid and home-system. By time – at least in some areas - they may be the first step for households to be connected at all, but to be later connected to a larger grid (by interconnection of mini-grids) or to the main grid. The latter implies that investment in such mini-grids must have a rather short break even period and must be designed and structured in a way to be future-proof for connection. ERA is currently working on interconnection modalities with assistance of Power Africa.

### 3 Sector Set-up and Institutional Responsibilities for Rural Electrification and Mini-Grid Systems

Major electricity sector reforms have redefined the role of the government in the electricity sector as enabler for private investments. GoU and its institutions develop the policy and plans to make proper use of the energy resources to meet the energy needs of Uganda's population. The unbundled electricity sector adopted the "single buyer" model where the transmission operator is the sole buyer and wholesaler of electricity while the private sector plays significant roles in power generation and distribution.<sup>7</sup> This liberalisation and unbundling has created a rather complex sector structure, which to some extent affects as well the task of the Consultant, as the proper locations of the envisaged off-grid sys-

<sup>4</sup> NARUC/Uganda Electricity Regulatory Partnership - Technical Workshop on Mini-grids Interconnection and Performance Standards, Concept Paper 2017.

<sup>5</sup> SE4All, p.32f and p.48

<sup>6</sup> SE4All, p.32f and p.38.

<sup>7</sup> World Bank – Energy for Rural Transformation Project', Project Appraisal Document, May 2015

tems will be a complementary element of electrification and as a consequence are affected as well by actions of a range of players active in the grid development.

### **3.1 Ministry of Energy and Mineral Development (MEMD) and Rural Electrification Board (REB)**

The Ministry has the overall responsibility for rural electrification policy and planning as a function of Government development policy and national planning. Within this range it outlined an approach to promote and implement rural electrification through grid extension, develop decentralised power supply systems and the use of renewable energy resources.

A Rural Electrification Board (REB) was established in 2001 to oversee the implementation of rural electrification activities. REB is chaired by the Permanent Secretary (PS) of the Ministry of Energy and Mineral Development (MEMD), and the Rural Electrification Agency (REA) is the secretariat to the REB to support the day-to-day operations.

### **3.2 Rural Electrification Agency (REA)**

REA was established as a semi-autonomous Agency by the Minister of Energy and Mineral Development through Statutory Instrument No. 75 of 2001, to operationalize Government's rural electrification function under a public-private partnership.

Direct and comprehensive responsibility for rural electrification sector planning and management is vested with the REA. It is the centralized authority for planning and implementing the resource requirements of the RESP, working with the beneficiaries and partnering with private-sector actors. This includes the responsibility for network expansion plans. REA – with the support of USAID and GIZ – is working currently to design master plans for all 13 of Uganda's service territories, to be finished by the end of 2017. Thus, the main relevant data for grid expansion – needed for off-grid planning - will be with REA.

REA's planning framework will be in the form of a rural electrification plan prepared and presented on an annual basis, incl. off-grid project investments. It will determine as well the technical standards and minimum requirements for off-grid systems. The RESP 2013-2022 (RESP 2) requires that each rural service territory has its particular long-range Master Plan which considers all features of electricity service, like type of interventions, constructions, funding and possible subsidy.

### **3.3 Electricity Regulatory Authority (ERA)**

The Electricity Regulatory Authority (ERA) was established in 2000 in accordance with the Electricity Act 1999 to regulate the generation, transmission, distribution, sale, export & import of electrical energy in Uganda, and to guide the liberalization of the electricity industry, manage licensing, rates, safety and other matters concerning the electricity industry. The ERA approved a multi-year retail tariff formula with quarterly automatic adjustments for fluctuations in fuel costs, exchange rates, and inflation in 2014. ERA cooperated successfully as a program partner in the implementation of the GET FiT Program Uganda. The main

purpose of this program was to fast-track a portfolio of up to 20 small-scale RE generation projects (1MW-20MW) by private developers.

ERA's responsibilities include the issue of "Certificates of Exemption" license documents, which regulate all spheres of isolated grid system such as micro and/or mini-grids according to the Electricity Order 2007 No.39.

ERA will be a key partner for the Consultant in the analysis and definition of the requirements for adequate conditions and regulations for the investment and operation of off-grid-systems.

Like REA, ERA could also serve as a potential project partner for the implementation of the envisaged future project of German Financial Cooperation with Uganda to promote Mini-Grids using a promotional scheme similar to the successful GET FiT program to make projects viable for private developers.

### **3.4 Uganda Electricity Transmission Company (UETCL)**

The Uganda Electricity Transmission Company (UETCL) is the sole buyer and wholesaler of electricity for the main power grid. It operates the transmission grid (above 33kV; length 1627 km in 2014). Furthermore it is the system operator and manages power import and export. UETCL is a Company wholly owned by GoU and has two equal shareholders, the Minister of Finance, Planning and Economic Development and the Minister of State for Finance in charge of Privatisation.

### **3.5 Power Distribution Companies**

The country is divided into 14 Service Territories (STs) that are operated by eight service providers (SP).

- The assets of the (former) public distribution utility (UEDCL) in the major load centers, which extends over 90 percent of the main grid, were leased to Umeme Limited (UMEME) in 2005 on the base of a 20 year concession. Today UMEME has about 5,500 employees.
- All other distribution assets in the non-Umeme concession areas were constructed by REA and contracted out to seven other electricity distribution SPs for operations and maintenance (O&M) on a commercial basis (total of 40,000 customers).

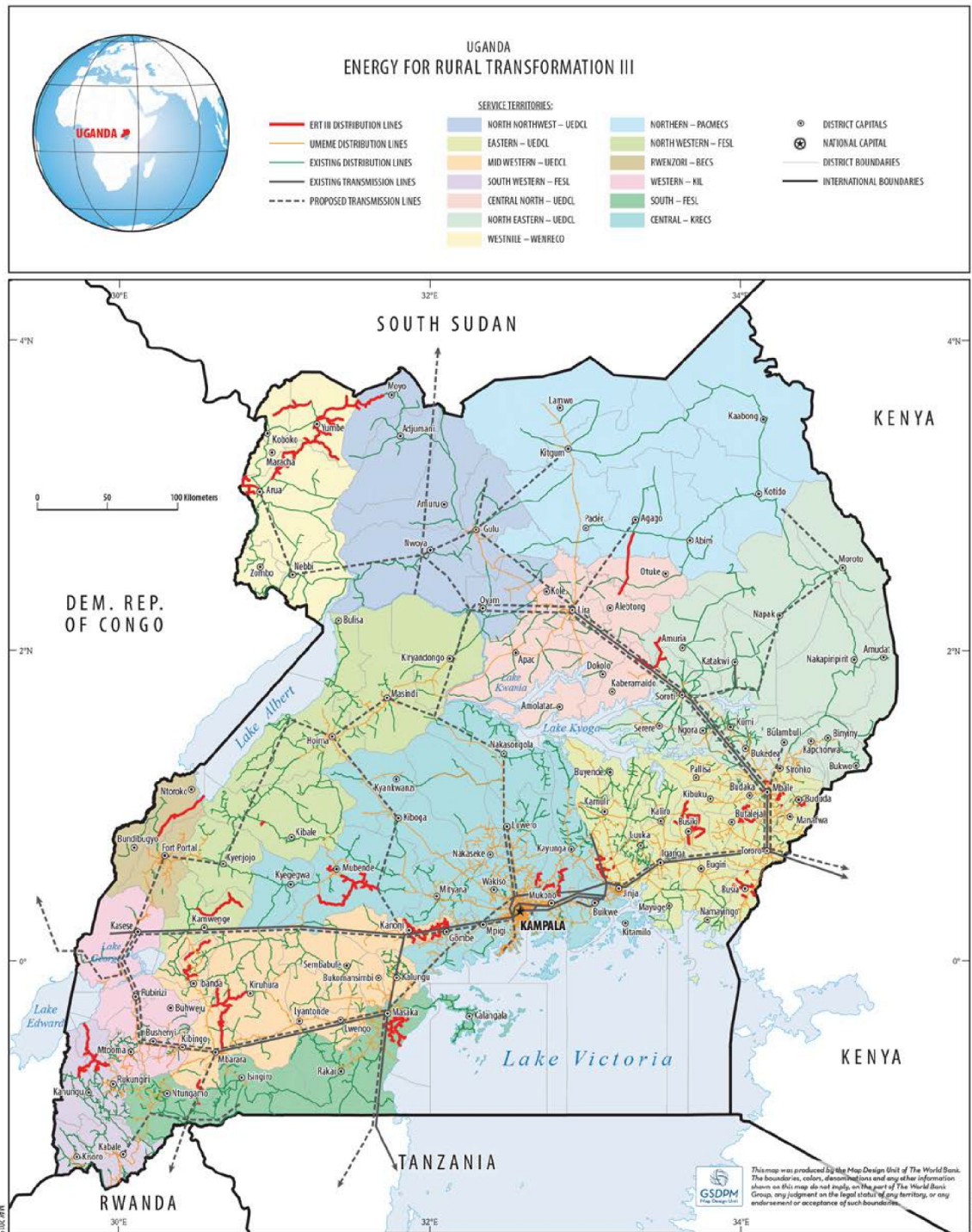
## **4 Regional Aspects of Electrification**

Outside the Central Region grid access rates in the rural areas of the various concession zones range from 0-29%.<sup>8</sup> However, looking on a national map we find that all over the country distribution lines penetrate even areas which are rather remote from the transmission grid<sup>9</sup>:

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<sup>8</sup> World Bank – Energy for Rural Transformation Project', Project Appraisal Document, May 2015

<sup>9</sup> Source of Map: World Bank – Energy for Rural Transformation Project', Project Appraisal Document, May 2015, p.147



But population is widely dispersed in Uganda’s rural areas making their electrification a complex endeavour facing the basic dilemma of rural electrification: With increasing distance to the existing grid connection cost grows while affordability tends to decrease. This results in classic supply and demand curves, leaving a considerable part of households on the demand side unattended, as at a certain point the marginal cost of supply by grid extension exceed the marginal returns from potential revenues. Thus an alternative to main grid connection has to be found to extend electricity beyond the commercial borders of grid connection. Off-grid systems based on renewable energy may be the best viable approach for such areas.

The area which will not be reached by the main grid until 2025-30 is considered the potential zone for off-grid systems.

This and the map above indicate clearly that rather detailed information is needed to determine actually adequate areas for off-grid systems, at least specific information about the

- future grid development,
- population (number and tendencies),
- settlement patterns,
- socioeconomic data (affordability, demand for electricity),
- availability of primary energy for renewables (solar irradiance, hydro potential).

REA has embarked on the master planning process to determine areas feasible for grid extension within the 10yr planning period and areas suitable for off-grid solutions.

- The process will include development of detail construction plans with time-lines.
- At least, the islands on Lake Victoria are being considered for off-grid electrification using mini-grids (Covered by a World Bank/AFDB project).
- Survey is being undertaken to identify population centres and collect socio-economic data necessary to undertake pre-feasibility studies.

REA will provide available data to the Consultant. However, it should be noted that at the time of drafting these background notes village data is limited as it shows only population numbers, but not the settlement structure and patterns. REA - with the support of GIZ and USAID - is working on the GIS databases and the Master Planning process to improve the data and the software to be finished by 2017. Recently the first of this series of Territorial Business Plans, namely the Northeast Service Territory Business Plan has been submitted as a draft. This report and all other coming reports in this line and the corresponding data will be made available to the selected Consultant.

## **5 Current Mini-Grid Projects and Activities**

Due to the scattered nature of settlements in Uganda, mini-grids will play a major role in increasing electricity access in Uganda. Many people are migrating into trading centres which is providing opportunities for decentralized mini-grids.<sup>10</sup>

Over the last decades some off-grid systems were developed in Uganda, mainly using micro-hydropower. Recently the approach gained momentum with more and more diversified (private) projects under development. These projects and the experiences of their developers may provide important lessons learnt for the Consultant of the Study to analyze the challenges of scaling-up the approach of mini-grids in Uganda.

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<sup>10</sup> BENA, p.6

## 5.1 Off-grid system projects and initiatives

**Implemented and active off-grid-systems** include among others the following mainly hydro-powered projects:

Name	Tech.	MW	Comment
Kisiizi Mini-grid	Hydro	0.354	Kisiizi Hospital Power Ltd – Joint Venture between Kisiizi Hospital and C.O.U. Active since 1984. 354kVA hydro turbines. Power is distributed 8 km towards Nyarushanje community and 2 km to Upper Kisiizi community. Over 300 connections.
Bwindi	Hydro	0.064	located in south western Uganda supplies power to hospital and neighbouring community. It was developed by GIZ and is operated by the community.
Suam	Hydro	0.040	located in eastern Uganda supplies power to a community. The project was developed by GIZ and is operated by the community.
WENRECO	Hydro	3.5	West Nile Rural Electrification Company (WENRECO) received a concession for generation and distribution of an already existing off-grid-system, powered by a 3.5 MW hydroelectric plant. WENRECO serves more than 12.000 customers. According to ERA definition, this is not a mini-grid (> 2 MW)
Kalangala Infrastructure Services	Solar-Hybrid	1.6	solar-battery-thermal hybrid project, which currently serves 2,000 households on Bugala Island by Kalangala Infrastructure Services (KIS) was commissioned in Jan 2015.
Absolute Energy Ltd	Solar Hybrid	0.150	at Kitobo Island on Lake Victoria to supply over 400 households and businesses

REA has received **proposals** for the following - mainly PV - **off-grid projects**<sup>11</sup>:

Name	Tech.	MW	Comment
Kirchner Solar Ltd	Solar Hybrid	0.022	power to 30 villages with about 150 households and businesses
REMERGY	Solar Hybrid	n.d.	to supply electricity to 3 villages in Kasese district
GRS Associates and Absolute Energy Ltd	Solar Hybrid	0.235	in Kalangala, a town on Bugala Island in Kalangala District, on Lake Victoria.

<sup>11</sup> Quoted from: Bena, p.5.



Konserve Consult Limited	Solar PV	0.300	Kimi Island, in Lake Victoria
Mandulis Energy Ltd.	Biomass	0.064	setting two 32kW gasification units using rice husks to power rice mills in northern Uganda and the neighboring community

Furthermore there are **new initiatives for future mini-grids**:

- Within the “Decentralized Renewables Development Program” executed by AfDB and RED/REA decentralized about 10 Mini-Grids are envisaged for the electrification of islands across Lake Victoria.
- The Uganda Energy Credit Capitalization Company (UECCC) has also provided financial support and technical assistance mini-grid developers, and is currently working with the ORIO Infrastructure Fund of the government of The Netherlands to support the development of 10 mini-hydro projects ranging from 0.5 and 5 megawatts. It is unclear if UECCC will continue to receive funding to provide financial and technical support to project developers.

## 5.2 Ongoing TA support for Mini-grid development and regulation

- USAID support
- NARUC (through Power Africa)
- EU/SE4ALL
- GIZ
- Shell Foundation/Open Capital Advisors

## 5.3 The Pilot: Development of Mini-Grids within the Promotion of Mini-Grids for the Rural Electrification (Pro Mini-Grids) by GIZ and REA

Within the Framework of German Technical Cooperation with Uganda GIZ, MEMD, REA and ERA are working on various activities to promote the provision of renewable-energy based mini-grids system to be operated by the private sector. This includes among others the development of pilot mini-grids in two zones (North; South-West) through an auction tender process open for private developers to select concessionaires/licensees for the implementation and operation of mini-grids.

**These activities serve as a pilot project for the potential future Financial Cooperation Project, for which this Study shall be elaborated. Consequently, these activities and the lessons to be learned will be of utmost importance for the Study under tender.**

The **profile of this pilot project** is as follows:

Item	Comment
<b>Project</b>	Mini Grids for rural villages (Pilot)
<b>Partners</b>	REA and GIZ
<b>Regions</b>	2 Zones (North and South);
<b>Villages and location</b>	North up to 15 villages (selected in one district) and South (up to 25 villages selected in two districts), More than 3 km distance to the main grid

<b>Technology</b>	Solar PV with battery (but open for other proposals from developers). NO Diesel hybrids; Required time availability 85%
<b>Generation Size</b>	Required peak power for individual mini-grids in the range of MW 0.03-0.08
<b>Grid Size / Demand</b>	Villages are relatively small: Individual mini-grids for an average of about 200 household connections; Number of connections per grid range between 60-500 .... Estimated consumption per household (6 kWh/month)
<b>Delivery Model</b>	Public Private Partnership – options and details to be determined Generation: BOT ( Build – operate – transfer); <i>(still to be determined)</i> Mini-Grid: BTO ( Build – transfer - operate); implementation by developer according to requirements defined by REA; from the beginning ownership by REA
<b>Tasks for private developer</b>	Implementation of generation sets and the mini-grid. Full technical and commercial operation of the system during the duration of lease/ concession
<b>Legal Aspects</b>	Lessee (Preferred by REA) or Concessionaire; Licence (exemption) required from ERA
<b>Duration of lease/ concession</b>	10 years
<b>Financial Aspects</b>	Tariffs for mini-grids to be approved by ERA (max for mini-grid so far 26 cts/kWh; main grid 19 cts/kWh); Dynamic generation and delivery cost estimated to be in the range of 30+ cts/kWh plus profit margin Details to be defined (depending on delivery scheme, ownership of components/depreciation, lease fee if any) Possible gap to be closed by support scheme
<b>Tender</b>	2 separate tenders (one for each region); approach and conditions may be adjusted to the needs of each region REA Procurement Department supported by Tender Agent Selection by Tender Committee (REA, ERA)
<b>Timeline</b>	First tender (Northern Territory) shall start Q4 2017; award of contracts Q1 2018; implementation and start of operations of first off-grid system within 2018
<b>Existing Studies</b>	Feasibility Studies for the two zones Framework Conditions for Mini-Grids Will be made available for pre-qualified bidders during tender period

It is in the nature of a pilot that it shall serve to test approaches. Accordingly, the evaluation of the pilot will be an essential component of the Study under tender, although the mini-grids tendered within the pilot scheme will not yet be operational during the execution of the Study. But the process, the business model and response from the private sector during the tender will allow for important lessons to be learned.

END OF NOTE