

# Unlocking Financing and Investments for Clean and Renewable Energy Access in Uganda: A Case of the Albertine Region.

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## List of the Abbreviations

ADC	Austrian Development Cooperation	GEF	Global Environment Facility
AfDB	African Development Bank	GETFiT	Global Energy Transfer Feed in Tariff
BADEA	Arab Bank for Economic Development in Africa	GIZ	German Agency for International Cooperation
CAO	Chief Administrative Officer	GoU	Government of Uganda
CBOs	Community Based Organisations	IAEA	International Atomic Energy Agency
CECAT	College of Engineering, Design, Art and Technology (CEDAT)	IBD	Islamic Development Bank
CEPA	Clean Energy Partnership Africa	IRDI	Integrated Rural Initiatives
CSBAG	Civil Society Budget Advocacy Group	JICA	Japan International Cooperation Agency
CSOs	Civil Society Organisations	KCSON	Kibaale District Civil Society Organizations Network
DANIDA	Danish International Development Cooperation	KIIs	Key Informant Interviews
DFID	Department for International Development	MDA	Ministries, Departments and Agencies
DLG	District Local Government	MEMD	Ministry of Energy and Mineral Development
DPs	Development Partners	MoFPED	Ministry of Finance, Planning and Economic Development
EA	Environmental Alert	MWE	Ministry of Water and Environment
EAETDN	East African Energy Technology Development Network-Uganda	NGO	Non-Governmental Organisation
EIB	European Investment Bank	NORAD	Norwegian Agency for Development Cooperation
ENR	Environment and Natural Resources	NPA	National Planning Authority
ERA	Electricity Regulatory Authority	ODA	Official Development Assistance
ERT	Energy for Rural Transformation	OECD	Organization for Economic Co-operation and Development
EU	European Union		
FDI	Foreign Direct Investment		
FGDs	Focus Group Discussions		
FiT	Feed-in-Tariff		

OFID	OPEC Fund for International Development	URA	Uganda Revenues Authority
OOF	Other Official Flows	UIA	Uganda Investment Authority
PFI	Participating Financial Institutions	UNACC	Uganda National Alliance on Clean Cooking
PPP	Public Private Partnership	UNBS	Uganda National Bureau of Standards
PPDA	Public Procurement and Disposal of Assets Authority	UNCDF	United Nations Development Fund
REA	Rural Electrification Agency	UNDP	United Nations Development Program
REFIT	Renewable Energy Feed-in-Tariff	UNIDO	United Nations Industrial Development Organisation
RICE-WN	Rural Initiative for Community Empowerment in West Nile	UNREEA	Uganda National Renewable Energy and Energy Efficiency Alliance
SACCO	Savings and Credit Cooperative Organisation	UREA	Uganda Renewable Energy Association
SFD	Saudi Fund for Development	USAID	United States Agency for International Development
SHS	Solar Home Systems	USTDA	United States Trade and Development Agency
SIDA	Swedish International Development Cooperation Agency	VSLA	Village Savings and Loan Association
UDB	Uganda Development Bank	WENRECO	West Nile Rural Electrification Company
UECCC	Uganda Energy Credit Capitalisation Company	WWF-UCO	World Wide Fund-Uganda Country Office
UEDCL	Uganda Electricity Distribution Company Ltd		
UEGCL	Uganda Electricity Generation Company Limited		
UETCL	Uganda Electricity Transmission Company Ltd		

## Executive Summary

Renewable energy is the most prevalent in electricity generation, with about 80 percent of Uganda's electricity coming from mainly hydropower. However, most households in Uganda don't have access to electricity. According to MEMD, less than 20.6% of the rural and 55% of the urban population have electricity services. Thus, majority depend on biomass energy, especially wood fuels using unclean and inefficient methods. Dependence on biomass energy is increasing pressure on natural resources, especially forests. Uganda has been losing on average 122,000 ha/year of forest every year from 1990-2015. Although Gov't, DPs & CSOs are promoting access to renewable and clean energy technologies, such interventions are still insignificant, to reduce the consumption of biomass energy.

The study investigated the opportunities and challenges for unlocking financing and investments for clean and renewable energy access in Uganda. The study employed both qualitative and quantitative approaches – mainly making use of document reviews, key informant interviews (KIIs) and Focus Group Discussions (FGDs). It reviewed secondary data and analytical studies from various sources, including international databases, government documents on clean and renewable energy financial mechanisms. Key informant interviews were conducted with 44 people (6 females and 38 males) at national & local levels (in Albertine region). Focus Group Discussions were held with 44 people from 18 districts in the Albertine region.

## Key Findings

### *Current finance flows*

Financing and investment towards renewable energy (RE) has been increasing over the last decade, when the sector was liberalized leading to increased investment by the private sector. Based on the available data from the Government of Uganda (GoU), and OECD, total financing towards RE sector is estimated at USD 3.1 billion. Over 70% (USD 2.3 billion) is by the private sector and 20 percent (USD 629 million) is by GoU budget allocations. A further analysis of the GoU budget allocations shows that Large Hydro Power Infrastructure projects<sup>1</sup> take a lion's share of the sector funding.

There is potential for providing energy access to Ugandans through solar Photovoltaic (PV), biomass /bagasse cogeneration, waste to energy, geothermal, and wind, however, most of investments have been made in hydro power generation and on-grid distribution than other sources of renewable energy.

### *Mechanisms being used to enhance investment in renewable and clean energy*

Numerous mechanisms are being used to enhance investment in renewable and clean energy, which include among others: i) Global Energy Transfer Feed in Tariff (GETFIT) programme aimed at realizing about 20 energy generation projects, ii) Energy Fund which was spent mainly on Karuma and Isimba hydropower stations, iii) Rural Electrification Fund (REF) which promotes equitable coverage of rural electrification in Uganda, iv) Subsidies and incentives such as The Renewable Energy Feed in Tariff (REFIT), v) Uganda Energy Credit Capitalisation Company (UECCC) which facilitates investments in RE sector, with a particular focus to enabling private sector participation through provision of Credit Support Instruments (CSIs), vi) Provision of credit for renewable energy technologies (RETs) by Financial institutions, companies and NGOs; and vii) Quality control and certification by Uganda National Bureau of Standards (UNBS).

### *Financing needs for scaling-up clean and renewable energy access in Uganda*

The evidence on how much money is needed for scaling-up clean and renewable energy access in Uganda, is quite limited. The absence of updated energy sector investment plan makes it hard to estimate the amount of financing and investment in clean and renewable energy. The estimates provided in the study are based on the Rural Electrification Strategy and Plan (2013-2022); and the Scaling-Up Renewable Energy Programme Investment Plan, which estimate that over USD 950 million and USD 455.1 million is needed by 2030, respectively. However, these estimates underestimate the broad financing in the RE sector since they only cover rural areas and public sector funding. However, both strategies and plans show that there is need for significant scaling-up in investment from current levels, if Uganda is to achieve its electrification targets.

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<sup>1</sup> Isimba (183MW), Karuma (600 MW), Ayago (840 MW), Muzizi (44.7MW), Nyagak III (504 MW), Agago-Achwa (83 MW), Oriang (392 MW), and Kiba (600 MW).

### *Opportunities for Investment in Clean and Renewable Energy Access in Uganda*

Some of the opportunities include among others: i) Supportive policy and regulatory framework such as the Vision 2040, National Development Plans (NDP) II, International commitments (SDG –Goal 7) & Sustainable Energy for All (SE4ALL) Action Agenda), the Electricity Act, 1999, Energy Policy 2002; ii) Supportive Institutional framework such as Public Institutions (MEMD, ERA, REA, UECCC, UEGCL, UETCL, UEDCL etc), development partners, NGOs, and private sector actors; iii) Financially viable electricity sector; iv) Domestic Funding opportunities by MEMD, Uganda Energy Credit Capitalisation Company (UECCC), development banks, United Nations Capital Development Fund (UNCDF), GETFiT programme, etc; v) International Funding opportunities by bilateral and multilateral organisations, and venture capitalist; and Investment in off-grid systems.

### *Constraints Limiting Financing and Investment for Clean and Renewable Energy in Uganda*

At International level, they include among others: preference for loans versus grants; approaches used by financial intermediaries which have stronger inclination to invest in large-scale projects; lack of aggregators that are able to package up many small projects; minimal investment in risk mitigation; high cost of doing business and lack of sound investor knowledge of the Ugandan market.

At national level, they include among others: unfavorable or confusing policy and regulatory environment; institutional weakness due to inadequate capacity, poor management, bureaucracy and lent seeking behaviour; fragmented funding landscape and a scattergun approach to projects; unfavourable taxation and subsidies regime which favour mainly large-scale electricity generation rather than small-scale RE projects; Government focus on investing heavily in on-grid large-scale hydroelectricity projects and Low absorption of funds by MEMD.

At local levels, they include among others: High initial costs of off-grid systems which make most RETs unaffordable by many households; Poor quality products; Weak marketing and maintenance systems; Inadequate funding at LGs levels, no budget allocation for clean and renewable energy access and limited knowledge of RETs (such as solar and efficient cook stove), their use and applicability.

## **Recommendations**

### **A. MEMD should:**

- i. Work towards reducing electricity tariffs of all electricity consumers through soliciting for cheaper financing options (grants or concessional loans) such as climate financing for any energy projects;
- ii. Ensure proper energy mix by investing more funds in other RE sources such as solar, geothermal and biogas;
- iii. Mix centralised top-down grid extension with decentralised demand-driven bottom-up strategies (mini-grids and standalone solutions);
- iv. Invest in skills and training for clean off-grid system installation, repairs and maintenance;
- v. Decentralise the coordination energy services at DLG levels to support the promotion of RE investments at the lowest levels;

### **B. MoFPED should:**

- i. Put in place a stable and predictable taxation regime for the renewable energy sector;
- ii. Work with development partners to devise appropriate financial instruments such as combining grants with loans in new areas of investment;
- iii. Work with MEMD to establish an innovation fund, linked to the renewable energy strategy to provide access to finance for entrepreneurs and local businesses in the off-grid industry;
- iv. Provide financing to UNBS in order to effectively certify, monitor and enforce standards of all RETs.

C. MWE through the Forest Sector Support Department and the National Forest Authority should ensure a sustainable forest management system through among others, operationalizing Uganda's National Tree Fund to provide sustainable financing for tree planting.

D. MWE, MEMD, NFA and LGs should advance and upscale the green charcoal production and related regulation of charcoal production in Uganda.

E. GoU and the Development Partners should support the implementation of the national biomass/charcoal strategy (2015).

F. Parliament should expedite the passing of the Consumer protection bill.

- G. UECCC should raise awareness of on-lending facilities for RE projects among market participants.
- H. Development Partners and NGOs should support LGs to develop and pass ordinances on sustainable use of biomass, especially firewood and charcoal.
- I. Development Partners should prioritise funding agencies that have a track record and experience with channeling funds to smaller-scale energy projects.
- J. Financial institutions should embrace and support the promotion of access and utilisation of RETs through provision of soft loans to their customers towards acquisition of RETs.
- K. MoFPED & MEMD should allocate funds Local Governments to support the promotion of renewable energy investments at the lowest levels.
- L. MEMD should decentralize the coordination of energy services at District Local Government levels to support the promotion of renewable energy investments at the lowest levels.
- M. LGs should recognise the energy sub-sector as part of the ENR and thus allocate funds and recruit staff to handle energy issues within the LGs. A certain percentage of the ENR condition grant should be earmarked for RE.
- N. LGs should demand that oil and gas royalties are provide and invested in promotion of renewable energy investments.

## Section 1: Introduction

### 1.1 Background

Environmental Alert in collaboration with the World Wide Fund-Uganda Country Office (WWF-UCO) is implementing a project titled, *“Increasing access to sustainable and renewable energy alternatives in the Albertine Graben to conserve high value forest ecosystems to benefit people and nature in Uganda.”* One of the key objectives of this project is to strengthen the capacity of civil society Organisations and networks operating in the renewable energy sub-sector to advocate for and drive change towards sustainable and renewable energy access. Interventions are being implemented at national and sub-regional levels involving Civil Society Organisations (CSOs) and networks that are involved in the promotion of sustainable and renewable energy as well as in issues that are interlinked with or rooted in lack of access to sustainable, clean and affordable energy. Vertical and horizontal linkages and synergies between the CSOs and networks at both the national and sub-regional levels are pursued for more structured policy engagements.

The project’s goal is, *“Communities living in the Albertine Graben have adopted sustainable and renewable energy alternatives to reduce dependency on biomass for their energy needs.”* The project has three outcomes: a) Civil society in partnership with other agents of change is transforming government and private sector decisions and practices towards sustainable & renewable energy development.

b) Government, private sector, civil society actors and local communities have adopted effective strategies and practices that support sustainable and Renewable Energy access.

c) Government and private sector have put in place an enabling environment that supports increased financing/investment for sustainable and Renewable Energy development.

### 1.2 Rationale of the Study

Uganda relies largely on renewable electricity with 895.5 MW installed capacity, of which 630 MW is from large hydropower, 65.84 MW from mini-hydropower, 64.5 MW from cogeneration and only 136 MW from Heavy Fuel Oil (HFO) fired plants (UBOS, 2016). However, according to MEMD, less than 20.6 percent of the rural and 55 percent of the urban population have electricity services (MEMD, 2016). This means that most households don’t have access to electricity and even those that have access to electricity are not using it for cooking /heating due to high costs, but rather depend on non-sustainable use of biomass energy,<sup>2</sup> especially wood fuels using unclean and inefficient methods. In 2012, Uganda National Alliance for Clean Cooking (UNACC) estimated that only 500,000 households (7 percent of the population) were using clean and efficient cook stoves while Uganda LPG Association estimates the number of households using LPG stoves in 2014 at 35,000. While the primary demand of biomass is for cooking purposes, a significant number of key industries in Uganda are also biomass consumers, namely brick making facilities, tea industry, lime industry, tobacco industry, sugar industry, cement industry, distillery and food industry.

Globally, there is a transition from non-renewable fossil fuels (coal, oil, and natural gas) to renewable clean energy sources (such as hydroelectric, wind, and solar power). Many countries are ramping up their commitment towards renewable energy through innovation and investment. This transition is being motivated by many factors, including concerns about environmental impacts (particularly climate change), limits on fossil fuel supplies, and prices (Harris J.M. & Roach Brian, 2016). Operating economies on clean and renewable energy flow represents a key component of sustainable development.

In Uganda, the use of biomass has negative health, gender, and environmental consequences. Since most households in Uganda use firewood for cooking with majority cooking indoors with no chimneys and any ventilation, this exposes them to biomass smoke leading to chronic obstructive pulmonary disease (COPD) which affects more women and children (Frederik van Gemert et al, 2013). Dependence on biomass energy is increasing pressure on natural resources, especially forests. The high rates of deforestation in Uganda are partly attributed to charcoal burning and wood fuel, since forests supply well over 90 percent of Uganda’s energy requirements in form fuel wood. The National Forest Authority (NFA) estimates that Uganda has been losing 250,000 ha of forests annually for the period 2005-2010 (MWE, 2016). In most households in Uganda, its women who often know the energy

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<sup>2</sup> According to UBOS (2013), 96 percent of households used biomass fuels for cooking.

needs of a home and struggle every day to ensure that food is on the table, despite the hardships they experience using the energy sources at their disposal. However, it is on rare occasions that the women are involved in acquisition of clean or improved energy sources.

Government of Uganda has made domestic and international commitments to increase access to modern energy services to all Ugandans. In the Vision 2040, government targets to increase electricity per capita consumption to 3,668kWh by 2040 by increasing national grid access rate to 80 percent with total installed generation capacity reaching to 41,738MW. Whereas, in the National Development Plans II (2015/16 – 2019/20) government targets to increase power generation capacity from 825MW in 2012 to 2,500MW by 2020 through investment in renewable energy sources including hydropower and geothermal (Republic of Uganda, 2015a). Under the Sustainable Energy for All (SE4ALL) Action Agenda which was launched by the United Nations (UN) Secretary General in September 2010, Uganda targets to double the share of renewable energy in the energy mix by 2030 (Republic of Uganda, 2015b).

The abundance of renewable energy resources presents a great opportunity for Uganda to ensure energy mix by investing in all forms such as solar, geothermal, biogas, efficient biomass systems among others. However, until now, Uganda has found it challenging to utilize many of these renewable energy resources and to ensure energy mix to accelerate energy access. The biggest challenge is limited financing and investment towards off-grid and efficient energy sources. Government efforts have largely focused on increasing energy access by increasing supply through investing in hydro-electricity plants. However, additional capacity comes at a hefty cost. On average, the investment cost per MW is US\$2.6M. This cost does not account for the cost of transmission and distribution to deliver electricity to end-users. Uganda's electricity household tariffs are currently US\$0.18 per kWh which is high for most households (Stephane de la Rue du Can et al, 2017) and is hampering energy access.

It's against this background that Environmental Alert carried out this study to examine the major enablers and constraints towards unlocking financing and investments for clean and renewable energy access in Uganda.

### **1.3 Objectives of the Study**

The major purpose was to conduct a study on unlocking financing and investments for clean and renewable energy access in Uganda.

#### **Specifically the study:**

- a. Provided an overview of the current finance flows towards clean and renewable energy access (off- grid and on-grid) in Uganda and gauged their potential for providing energy access to Ugandans;
- b. Reviewed the current constraints (both policy and practice) at international, national and local levels that are limiting financing or investments for clean and renewable energy access (off-grid and on- grid) in Uganda;
- c. Identified the enablers and available opportunities for investment in clean and renewable energy access (off-grid and on-grid) in Uganda;
- d. Assessed the financing needs for scaling-up clean and renewable energy access (off-grid and on-grid) in Uganda;
- e. Suggested recommendations for addressing the underlying gaps/constraints at international, national and local levels.

### **1.4 Methodology**

The study employed both quantitative and qualitative approaches – mainly making use of document review, interviews, and focus group discussions. The research team engaged various stakeholders in the energy sector at both national level and Albertine region. Quantitative and qualitative information was integrated in an iterative manner so as to identify why and how the observed trends emerge, ensuring the findings are useful for pinpointing and articulating appropriate recommendations.

The study used four primary data collection methods: secondary document review, key informant interviews (KIIs), focus group discussions (FGDs) and a validation workshop. Each of these methods is described below.

- a) *Document review*: This involved the collection and review of secondary data and analytical studies from various sources, including international databases, government documents, as well as reports on clean and renewable energy financial mechanisms. Data was collected mainly from OECD Credit Reporting System, MoFPED, MEMD, Development Partners, Private sector actors and NGOs (mainly in the Albertine region) to identify the amount spent on clean and renewable energy.
- b) *Key informant interviews (KIIs)*: KIIs were conducted with 44 people (6 Females and 38 Males) at national and local levels (in the Albertine region). These included government officials, development partners, private sector actors, Local Government officials and CSOs. The key informant interviewees were purposely selected based on their knowledge and expertise on clean and renewable energy issues. The list of respondents is attached in the *Annex 1*.
- c) *Focus Group Discussions (FGDs)*: Three FGDs were held with 49 people (5 Females and 44 Males) from 18 districts in the Albertine region. The FGD participants included private sector actors and NGOs dealing in renewable and clean energy in the region. Through the FGDs, we were able to capture stakeholder's views to access renewable and clean energy. The list of FGD participants is attached in the *Annex 1*.



**Figure 1:** FGD meeting with NGOs and CBO representatives in Masindi. **Source:** Environmental Alert.

- d) *Validation meeting*: A validation workshop was held on 17<sup>th</sup> May, 2017 with selected stakeholders. At the workshop, the research team presented the draft preliminary findings, conclusions and recommendations and facilitated discussion among the participating stakeholders around them. The primary objectives of the validation workshop were to better understand the study findings, increase their utility and improve the consistency of the report findings, conclusions and recommendations with respect to stakeholders' views. A secondary, albeit important, objective of the validation workshop was to disseminate the study findings to key stakeholders.



**Figure 2:** The Lead Consultant, Mr. Daniel Lukwago presenting the draft report during the validation meeting held on 17<sup>th</sup> May, 2018. **Source:** Environmental Alert.

For quality control purposes, at the commencement of the study, the research team developed and shared the inception report for the study with EA technical team. The methods, approaches and tools were presented by the research team which were reviewed by the technical team from EA. In addition, a draft report was presented to the EA technical team that reviewed it and provided comments.



**Figure 3:** Mr. Wilson Wafula; Commissioner, Renewable Energy MEMD, giving his Remarks during the validation meeting held on 17<sup>th</sup> May, 2018. **Source:** Environmental Alert.

### 1.5 Scope and Coverage

The study was carried out at both the national and 18 districts<sup>3</sup> in the Albertine region. In total, the study conducted interviews from 84 respondents at the national and district level. The districts were purposely selected from the Albertine region because it's where the project is being implemented. The participants were also purposely selected basing on their involvement, knowledge and expertise in the energy sector, especially on clean and renewable energy issues. The study was undertaken between November 2017 and March 2018.

### 1.6 Limitations of the Study

*Adequacy, quality and availability of data and information:* There were difficulties in accessing official data on financing for the renewable energy sector, especially from private sector and development partners. In addition, there is limited disaggregated data on financing for the different renewable energy types which made it difficult to come up with specific information on financing for each type of renewable energy. Consequently, this report was drafted using a variety of estimates based on secondary data sources and to some extent, key informant interviews.

In addition, it's hard to find disaggregated data on financing for different types of renewable energy sources in Uganda. Thus, this study was not able to provide disaggregated data on each renewable energy source.

*Limited interviews at national levels:* Despite numerous requests, the study team was only able to interview 53 percent of the potential stakeholders in the energy sector at national levels. This was partly attributed to the timing of the study (during Christmas and beginning of year) and a lengthy bureaucratic process to obtain interviews, which made it hard for most responsible people to participate in this kind of study. Therefore, the study mainly relied on literature review of relevant studies, publications and databases of key institutions.

*Sample Size:* The limited resources allocated to this study imposed a binding constraint on the number of local governments that could be covered. However, we are confident that the three case study districts (Arua, Kagadi & Kasese) provided a good picture of what is happening in most LGs in the Albertine region. Nonetheless, the study findings, conclusions and recommendations can be applied to the entire country since the study will also be carried out at the national level.

*Methodology:* Although we are cognizant of the Multi-Tier Framework (MTF<sup>4</sup>) for measuring energy access, however, this study was based on the binary system of measuring energy access (have or have not).

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<sup>3</sup> Arua, Buliisa, Hoima, Kagadi, Koboko, Kyengojo, Masindi, Moyo, Nebbi, Nebbi, Kaseses, Pakwach, Bundibugyo, Bundibugyo, Kabarole, Rubirizi, Kibaale, Rukungiri.

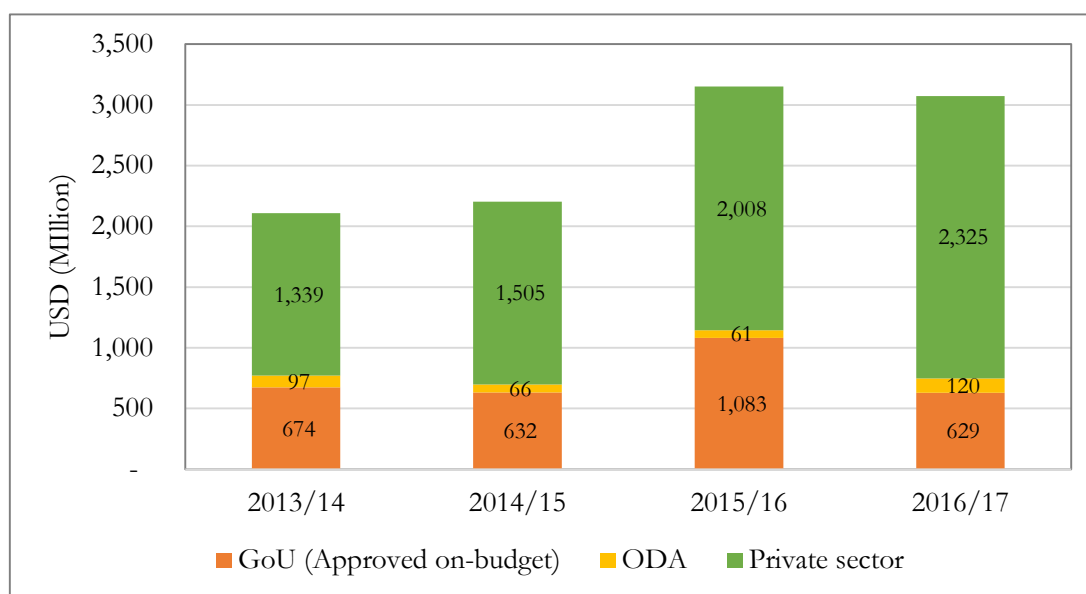
<sup>4</sup> the ability to avail energy that is adequate, available when needed, reliable, of good quality, convenient, affordable, legal, healthy and safe for all required energy services.

## Section 2: Financing and Investment towards Clean and Renewable Energy Access in Uganda.

### 2.1 Current finance flows

According to the Renewable Energy Policy 2007, modern renewable energy means renewable energy resources that are transformed into modern energy services like electricity, which can be generated from water power, wind power, solar energy, geothermal energy and biomass cogeneration. Whereas clean fuels are derived from renewable energy resources like biogas, ethanol, methanol, hydrogen, biodiesel or solar water heating. In the context of the policy, modern biomass technology includes energy efficient technologies, like improved charcoal and firewood stoves for both domestic and institutional applications.

Financing and investment towards renewable energy in Uganda has been increasing over the last decade when the sector was liberalized leading to increased investment by the private sector. Based on the available data from the government of Uganda (MEMD & ERA), and OECD<sup>5</sup>, total financing towards renewable energy sector is estimated at USD 3.1 billion in 2016/17. Over 70 percent (USD 2.3 billion) is by the private sector and 20 percent (USD 629 million) is by GoU budget allocations (See *Figure 4*). Hydro-electricity takes the largest chunk of financing followed by solar and to a small extent, biomass /bagasse cogeneration.



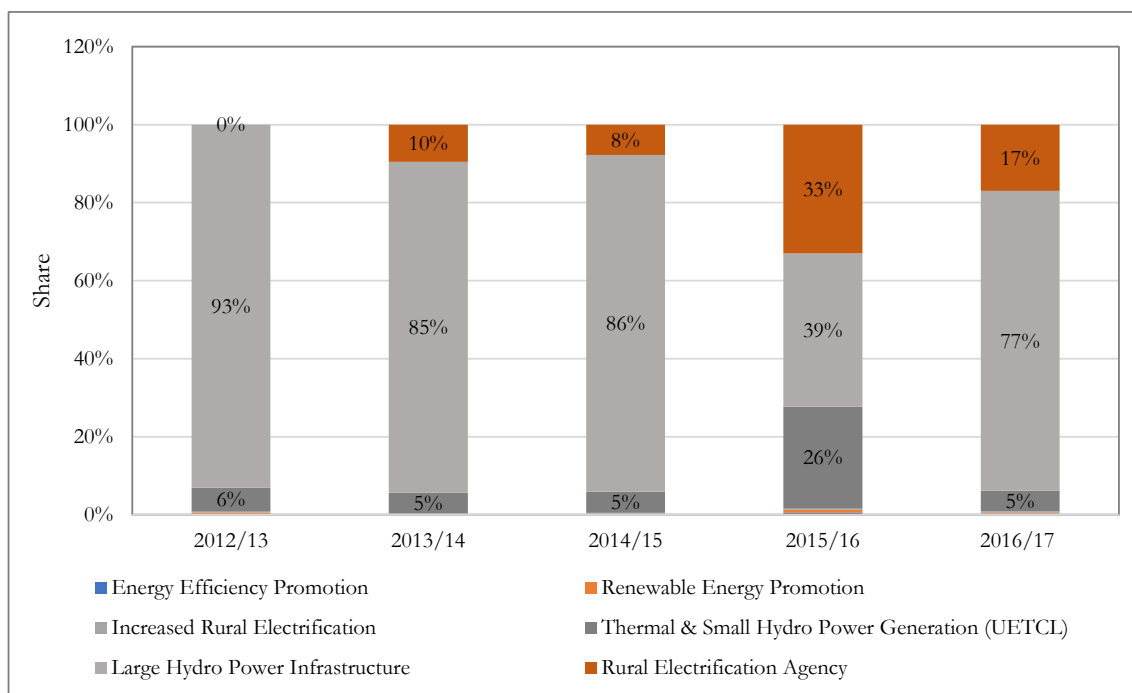
**Figure 4:** Financial Flows in the Energy Sector in Uganda (US \$ Million).

**Source:** Author's computations based on data from MoFPED, OECD & ERA.

Under the Government of Uganda (GoU), we captured only on-budget allocations to MEMD, REA, ERA, UEDCL, UEGCL, and UETCL. However, we only captured budget allocations to REA, ERA, UEDCL, UEGCL and UETCL for FY 2015/16 and 2017/18.

The GoU is only providing capital to projects and companies in a restricted number of sub-sectors in the energy sector. These include large hydro at significant scale (these take a lion's share of the sector funding (see *Figure 5*), and small-hydro, solar at a very limited scale, with biomass power and biogas sub-sectors not benefitting from domestic public grants.

<sup>5</sup> Data extracted on 19 Apr 2018 15:47 UTC (GMT) from OECD.Stat:  
<http://stats.oecd.org/index.aspx?DatasetCode=DACSECTOR>.



**Figure 5:** Intra-sectoral Budget Allocations in the Energy Sector.

**Source:** Author's computations based on data from MoFPED (approved budget estimates).

GoU and its development partners are mainly focused on grid extension, the development of large hydro projects and to some extent large solar PV has resulted into the lack of instruments oriented towards private financing of technologies for cooking and for off-grid that would impact the greatest (and poorest) proportion of the Ugandan population.

Therefore, there are significant opportunities for development partners and the private sector to scale up support to sub-sectors where technologies and projects benefit poor and rural populations. This includes significant support to off-grid sources such as solar, biogas, biomass and for cooking. This should be undertaken in financial collaboration with national, local government agencies and departments, and local financial institutions.

## 2.2 Potential for providing energy access to Ugandans

Uganda has considerable unexploited renewable energy resources for energy production and provision of energy services. These resources include biomass, geothermal, large scale hydro, mini/micro/pico hydro, wind and solar energy. The renewable energy potential of Uganda is shown in Table 1.

**Table 1:** Renewable Energy Potential

Energy Source	Estimated Electrical Potential (MW)
a. Hydro	2,000
b. Mini-hydro	200
c. Solar	200
d. Biomass	1,650
e. Geothermal	450
f. Peat	800
g. Wind	-
<b>Total</b>	<b>5,300</b>

**Source:** ERA (2014a).

Uganda plans to use renewables to increase power capacity, improve electricity access and expand rural electrification. In the Vision 2040, Uganda proposes to increase electricity capacity to 41,738 MW to drive industrialization via expansion of power capacity including hydro, geothermal, solar, biomass, among others.

Renewable energy expansion is currently being supported by feed-in tariffs (FiT)<sup>6</sup>. The priority renewable technologies for REFiT in Phase 2 include: Small hydro power plant; geothermal power plant; Bagasse power generation; Landfill gas power plant; Biogas; Biomass/ Municipal Solid Waste (MSW); and Wind (ERA, 2014a).

*a. Hydro power*

Government in collaboration with the private sector and with support from development partners is investing heavily in on-grid large scale hydroelectricity projects<sup>7</sup> which will increase electricity production to over 3,247 MW over the next decade. The large hydro infrastructure was allocated over two-thirds of the MEMD budget in 2017/18. In addition, there are over 50 potential sites identified on small rivers for generation of electricity of over 164 MW (see Annex 2). The GETFiT programme will enable the development of some of these small hydro (1-20 MW) projects. The increased electricity production will lead to increase in energy access to most Ugandans, if the challenge of high electricity tariffs is addressed.

*b. Solar Photovoltaic (PV)*

The solar PV market in Uganda has steadily grown over the last 15 years with new players, including foreign investors, entering the market with over 200 companies involved in the solar business (both PV and solar thermal), 72 of whom are also members of the Uganda Solar Energy Association (DFID & MEMD, 2016). Existing solar data clearly shows that Solar Home Systems (SHS) are the best option for providing electricity services to scattered homes in rural areas and households with low energy consumption, as they don't require extension of grid lines, which is not only costly but has also become challenging in the Ugandan context due to the difficulties in acquisition of Way Leaves and the Right of Way (DFID & MEMD, 2016). However, at present, solar photo-voltaic (PV) electricity is not generated in sufficient quantities for inter-connection to the national grid. To address these challenges, the Government of Uganda and the GETFiT programmes introduced a Solar-PV under the GETFiT Premium Payment Mechanism (GFPPM), two developers (Access Solar and Tororo North Solar) were awarded licenses to develop two (2) projects of 10MWp Projects. In addition, REA in partnership with EU and GIZ is establishing 25 Mini grids in villages of Northern Uganda, 15 Mini grids in the Southern Service Territory of Rakai/ Isingiro districts.

Development Partners and NGOs have helped to stimulate off-grid systems (especially solar PV) through a variety of incentives and capacity building measures. Hundreds of thousands of small off-grid installations are in place. These include: Pico Solar Systems which are widely available over the counter; Solar Home Systems that provide significantly more power than Pico solar and Institutional PV Systems provide power in schools, health centres, police posts and other institutions.

*c. Biomass / Bagasse Cogeneration*

There is potential of 460 million tons of biomass standing stock with a sustainable annual yield of 50 million tons. Currently, three sugar factories are developing generation plants using sugar cane waste (Bagasse), as fuel. These include Kakira (32 MW), Mayuge (9 MW) and Kaliro (11.9 MW). In addition, REA supported Pamoja Energy Limited in the generation and sale of electricity from a 32kw biomass gasification project in Mpigi District and an 11kw solar-biomass gasification hybrid project in Mityana district. Furthermore, the African Development Bank (AfDB) approved a USD 1 million grant to support Earth Energy Limited for the development of a 20MW biomass power plant in northern Uganda<sup>8</sup>.

There are initiatives (such as Uganda Domestic Biogas Programme, and Africa Biogas Partnership Programme) that promote and facilitate the preparation and implementation of a large-scale domestic biogas. Through such initiatives, institutions such as schools have been able to reduce their energy expenditure. For instance, Kansanga Primary school, Kampala, reduced the school's energy expenditure (from firewood to biogas) reduced by UGX 1.5M per month by use of bio-latrines (biogas generation) [Kigali Dan K., 2017].

*d. Waste to energy*

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<sup>6</sup> FiT are an internationally recognized regulatory mechanism used to promote and increase the amount of electricity generated from renewable sources, by providing a fixed tariff based on the levelized cost of production for a guaranteed period of time (ERA< 2014a).

<sup>7</sup> Isimba (183MW), Karuma (600 MW), Ayago (840 MW), Muzizi (44.7MW), Nyagak III (504 MW), Agago-Achwa (83 MW), Oriang (392 MW), and Kiba (600 MW).

<sup>8</sup> <https://www.esi-africa.com/uganda-afdb-supports-biomass-power-plant/>.

According to available estimates, it is projected that Kampala city alone generates 730,000 tons of waste per year, of which 70 percent is organic waste. There are major districts around the country, with considerable waste volumes such as Wakiso, Mbarara and Jinja, all of which represent considerable waste to energy potential (UIA, 2017). However, currently, there is minimal investment in conversion of municipal waste to energy.

*e. Geothermal*

Geothermal energy, is one of the possible alternative renewable energy sources in Uganda, which can supplement other sources of energy. More than 40 geothermal sites were studied, with an aim of establishing their electricity generation prospects. The investigations revealed three major potential areas for detailed exploration, namely; Katwe-Kikorongo, Burunga and Kibiro. The combined geothermal potential from these three major areas is 450MW. These are all situated in or near the Western Rift Valley of Uganda (zone of most recent volcanic activities) [ERA, 2014]. However, due to the risks, high drilling costs as well as the long lead time required to complete the studies and development, there is likely to be no generation from geothermal until 2025 (ERA, 2016a).

*f. Wind*

Based on wind data collected by the Meteorology Department, it was concluded that the wind energy resource in Uganda is only sufficient for small-scale electricity generation and for special applications such as water pumping, mainly in the north-eastern part of Uganda (Karamoja) and on the shores of Lake Victoria. Small industries in rural areas, where targets for a mill range from 2.5kVA to 10kVA could benefit from the wind resource.

### **2.2.1 Mechanisms being used to enhance investment in renewable and clean energy**

Some of the mechanisms in place aimed at enhancing financing and investment in renewable and clean energy in Uganda include:

- a. *GETFiT Programme*. The main objective is to overcome investment barriers for private developers of small-scale (1-20 MW) renewable energy projects. The programme is jointly designed by the GoU, ERA and KfW to leverage more private capital into renewable energy generation. GET FiT is supported with grant funding from the Government of Norway (EUR equivalent of about 17 million), the Government of the United Kingdom (EUR equivalent of 40 million), the Government of Germany (EUR 15 million), the European Union (EUR 20 million) as well as the World Bank through a Partial Risk Guarantee; committed US\$ 160 million. The programme aims at realizing about 20 energy generation projects with a total installed capacity of roughly 170MW. Since its launch in March 2013, the GET FiT Uganda programme has created a unique momentum for the development of small-scale, private renewable energy projects in Uganda. GET FiT has approved 17 projects with a combined generation of 128 MW of Small Hydro, Biomass, Solar photovoltaic and Bagasse generation projects which will be commissioned within 2 to 3 years from the start of construction. Overall, GET FiT has attracted more than US\$ 450 million of private investment into Uganda (ERA, 2018)<sup>9</sup>;
- b. *Energy Fund*. The Energy Fund was created during the 2008/09 budget, with allocations from tax revenue, in response to the challenges the country was facing at that time with electricity supply. The Energy Fund is required to spend at least 70 percent of its money on renewable energy, and the expenditure to-date has been devoted to two large hydroelectric projects: Karuma and Isimba (Whitley S and Tumushabe G, 2014);
- c. *Rural Electrification Fund (REF)*. The REF was established 'to promote the equitable coverage of rural electrification in Uganda through increased provision of access to electricity for economic, social and household use'. REF invests in transmission lines and in power-distribution networks, isolated grid projects comprising generation and distribution activities, and in stand-alone systems using renewable energy such as solar home systems (MEM, 2012). The REF, which is administered by the REA, is financed through: a levy of 5 percent applied on all bulk electricity sales, parliamentary appropriations, surpluses from the operations of the ERA and grants from donors and loans (including the World Bank) (Tenenbaum et al., 2014);
- d. *Uganda Energy Credit Capitalization Company (UECCC)*. The UECCC is a Government Institution set up under the Companies Act as a Company Limited by Guarantee and not having share capital. It was operationalized in 2009 under Energy for Rural Transformation phase two (ERT - II) primarily to facilitate investments in

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<sup>9</sup> <http://www.era.or.ug/index.php/opportunities/investment/renewable-energy-investment-guide>.

Uganda's Renewable Energy Sector, with a particular focus to enabling private sector participation. UECCC is the Administrator of the Uganda Energy Capitalization Trust ("The Trust") which is a framework for pooling resources from Government and Development Partners and to channel the same to Renewable Energy Projects and Programmes;

UECCC's support for Renewable Energy Programmes is normally provided by way of Credit Support Instruments (CSIs) to Participating Financial Institutions (PFIs) to facilitate provision of credit for Renewable Energy projects; or in the form of Technical Assistance to the projects. Some of these CSIs include:

- i. *Solar Loan Programme*; This financing facility is extended to Tier IV Financial Institutions (Micro Finance Institutions & Savings and Credit Cooperative Organisations-SACCOs) for on-lending to their members to acquire solar systems. This facility aims at addressing the affordability barrier posed by the initial upfront cost of acquiring solar systems by clients in the rural communities. UECCC is currently working with Tujijenge Uganda Limited, Hofokam Limited, EBO SACCO Limited and Buyanja SACCO Limited to extend Solar Loans to households and commercial enterprises.
- ii. *Working Capital Facility for Solar Companies*; This facility is funded by the World Bank under the ERT III. UECCC is the implementing agency of the Financial Intermediation sub component. Under this Facility, UECCC is extending Lines Of Credit to Financial Institutions to provide Working Capital loans to Solar Companies that are selling systems on a Pay As You Go, Pay Plan and Cash Business models. The FIs accredited to offer the Facility are: Centenary Bank, Barclays Bank Uganda, Stanbic Bank Uganda, Finance Trust Bank and Post Bank Uganda.
- iii. *Connection Loan Programme for On-grid Connections*; In partnership with Centenary Bank and West Nile Rural Electrification Company (WENRECO), UECCC piloted a Power Connection Loan facility to enable residents and businesses in West Nile region to get access to electricity from Nyagak Hydro Power plant. This facility has been rolled out to all 65 branches of Centenary Bank country wide. The main objective of the Connection Loan Programme is to address the affordability barrier faced by households and/or commercial enterprises on account of the upfront costs associated with connecting to grid electricity. The eligible purposes include; wiring costs, pole services, Utility connection fees (meter and drop wire from the pole), and conversion costs from diesel powered systems to grid electricity where applicable.
- iv. *Domestic Biogas Loan Programme*; UECCC is currently implementing a pilot Biogas Financing Programme in partnership with EBO SACCO Ltd through extended financing to EBO SACCO for on-lending to its members (households and/or Business Enterprises) in the rural areas to acquire biogas systems for lighting and cooking. On successful completion, the facility will be rolled out to the whole country.
- v. *Transaction Advisory Services and other early stage support*; UECCC provides support for power generation project developers through an Early Stage Support programme funded by KfW. The Early Stage Transaction Advisory Framework was developed as a tool to overcome the existing bottlenecks faced during the early stages of the Project Development cycle for small-scale renewable energy projects, with a view to increasing opportunities for private Project Financial Closure. During the course of the project, 6 private project developers were awarded assistance through the programme including: Savimaxx- 8.5 MW Lower Nsongya Mini Hydropower Project; Network Civil Engineering 4.0 MW Nyabuhuka – Mujunju Small Hydro Power Project; SAIL Sugar Processing - & Bagasse Cogeneration Plant (SAIL Project) of 11.9 MW; Earth Energy 20 MW Biomass Power Project; African Renewable Energy (ARE) 3.5 and 17 MW ESIA Mixed Farms Bagasse Project in Adjumani and Cresta 5 MW Run of the River Hydro Power Project.
- e. *Subsidies and incentives*. Some of the incentives provided by government and ERA to promote development of renewable energy include: The Renewable Energy Feed in Tariff (REFIT), long term developed Standardised Power Purchase Agreements (PPAs) and carbon credits through Clean Development Mechanism (CDM)<sup>10</sup>. This has resulted into the reduction in advisory service costs and the time required to negotiate the first

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<sup>10</sup> The revenue inflow to the subject project from the sale of carbon credits will not affect the Feed in Tariffs downwards.

initialising of a standardised PPA by a developer and UETCL (from six months to one week)<sup>11</sup>. This has encouraged more investors in the energy sector because of the stability of the tariff and the availability of the buyer, UETCL. There are also a range of regulatory incentives under the Energy Fund and Rural Electrification Fund for private investors in the energy sector which reduces transaction costs for both project developers and investors.

*“There is a guarantee by GoU through the rural Electrification Fund for licensed energy projects this encourages investments and also gives security to the investors” – ERA Official.*

In addition, some LGs have put waivers on payment of business licenses for any players dealing in RETs. A case in point is Kasese Municipality.

*“Any person dealing in RETs doesn’t pay for a trading license, this has supported many people in joining the trade hence increasing access to RETs across the district” - Head ENR-Kasese DLG.*

Furthermore, government with support from development partners (World Bank and Kfw) is connecting all households within a certain radius free of charge to grid electricity. However, the household has to meet the cost of wiring the house which in most cases is still high;

- f. *Energy Rebates:* under this arrangement, ERA is able to effect reimbursement to an eligible person/firm who has designed, financed and constructed electricity distribution infrastructure; the reimbursement is in terms of energy consumed where a customer’s monthly bill is to be off-set through an Energy Rebate<sup>12</sup>. This has encouraged private individuals with small and medium enterprises to invest money that will later be offset up to 40 percent of the bill. Many have gone an extra mile to distribute the energy to neighboring households to increase on the energy offset by the end of the year. It was noted that this only applies to a minimum length of 500 meters;
- g. *Provision of credit for renewable energy technologies (RETs).* Some financial institutions such as Pride Microfinance, Centenary Bank, Finance Trust Bank, Barclays Bank Uganda, Stanbic Bank Uganda, Finance Trust Bank, and Postbank Uganda are providing for working capital loans to RETs service providers like solar companies with credit support from UECCC, and also are for on-lending to end-users (households and commercial enterprises) for solar systems acquisition. Consequently, a number of companies are able to provide affordable and quality solar systems to households and commercial enterprises and solar is slowly becoming more popular than before.

*“We are partnering with a number of organisations both government (UECCC) and NGOs to provide loans to clients who want to access these renewable energy products mainly solar and improved cook stoves.” – Centenary Bank Official.*

**Box 1: Centenary Bank Financing for RETs.**

- Has been partnering with both government and NGOs to provide credit/ loans for renewable energy, especially solar and cook stoves.
- Piloted the power connection loan with WENRECO in West line. Now being marketed in all branches all over the country.
- Contributed 50 percent of the loan pool from UECCC towards acquisition of solar systems and working capital for companies.
- Provide Cente-Solar loan to finance standalone solar systems.
- Has dedicated staff to manage the relationship for UECCC and UREA.

**Source:** Interview with Manager Consumer Lending on 9<sup>th</sup> March, 2018.

<sup>11</sup> <http://www.era.or.ug/index.php/opportunities/investment/renewable-energy-investment-guide>.

<sup>12</sup> The Monthly Rebate amount shall be 40% of the actual active energy (kWh) units consumed by the customer, as metered and billed by the distribution utility.

In addition, some companies such as M-Kopa, Phenix, Solar Delight, Bright Life Finca and Village Power provide soft loans to enable households, especially to acquire Solar Home Systems using Pay As You Go Solar system and other mechanisms. Through this, the household can acquire the SHS through paying in installments.

*“We provide them financing since they can’t pay upfront. They make daily payments or break down these payments in chunks that rural people can afford since they don’t have monthly salary but rely on agricultural financing which is irregular. We allow people to pay money when they have it. They slowly pay for their system until when they own it. Some pay for 1 year, others 1 and 1/2, 2 or 3 years.” - M-Kopa.*

**Box 2:** Sustainable financing mechanisms for RETs.

- Pay as you go models where customers pay an upfront cost and then small installments over an agreed upon time period for the energy service using mobile phones.
- Customers can access credit from SACCOs, VSLAs or other associations to meet the upfront cost of acquiring off-grid solutions, and then pay back later with low interest.
- Revolving funds- the funds recovered from installments paid by customers that have acquired off-grid solutions such as solar PV systems facilitate extension of products or services to new customers.
- Cost sharing- where the suppliers and the user-users (consumers) share the cost the RETs.
- Flexible through instalments based on agricultural seasons.

Furthermore, some organisations such as WWF-UCO are providing funding to enable both end users and suppliers to increase access and utilisation of RETs. The funding is largely geared at reducing the risk of private sector players to enable them reach the hard-to-reach areas and also enabling end users to purchase RETs, especially Solar Home Systems. With such funding, suppliers have opened outlets of RETs in remote trading centers. This has enabled people in hard-to-reach and remote areas to access clean and renewable energy products.

*“...we sensitize communities to save money in their SACCOs so as they can acquire loans to purchase some RETs, if they save 20% on the cost of the technology, we provide them with the technology and pay the 80% in installments” - Kasese People’s SACCO;*

- h. *Provision of enabling environment.* With support from WWF-UCO, GIZ and UNHCR, DLGs in the Albertine region have developed District renewable energy access strategies and some have developed guidelines for mainstreaming energy in their District Development Plans (DDPs). In addition, some DLGs such as Arua have enacted ordinances that prohibit indiscriminate cutting of trees for charcoal burning. This has discouraged households from using charcoal and to adapt more efficient energy sources such as improved charcoal stoves. Some DLGs are implementing responsible timber trade where traders apply for licenses to produce timber and there is routine law enforcement in the conservation areas and on main trade routes to arrest any illegal activities. The major challenge is inadequate resources (funds and personnel) for effective implementation of these strategies and ordinances.

*“...the ordinance on regulation of trade in charcoal burning and trade is in the final stage of reading by the district council” – Environment Officer, Arua DLG;*

- i. *Capacity building.* Among the challenges of low uptake of clean and renewable energy in Uganda is limited capacity by the suppliers to install and maintain RETs. To address this challenge, some players (such as WWF-UCO and her partners) are training suppliers and technicians on proper installation and maintenance of RETs, especially solar energy;
- j. *Community sensitisation.* Some NBOs have collaborated with LGs to sensitize communities on the need to appreciate the benefits and availability of renewable and sustainable energies such as solar and improved cook stoves. This is done through radio talk-shows, sales agents and community meetings or dialogues. In addition, some NGOs have organised community dialogues on innovative methods for financing clean energy.

*“Whenever I am in the community under the various ENR programmes, I talk about the need to adapt to the new clean energy technologies that will reduce overdependence on Biomass like biogas”- Head ENR-Kasese DLG;*

- k. *Quality control and certification.* To address the challenge of counterfeits and poor quality RETs, with support from World Bank under the ERT project, the capacity of Uganda National Bureau of Standards (UNBS) is being built in certification and quality control of all RETs in Uganda. According to the UNBS, some of the RETs have been categorized and profiled as high-risk products in terms of safety to the users and are required to be inspected from the countries of origin before they come in through the Pre-Export Verification of Conformity to Standards’ (PVOC). In addition, the energy efficiency standards importers User Guide has been developed and Energy efficiency lighting test bench was installed at UNBS premises (MEMD, 2017). Furthermore, UNBS intends to retest all electricity meters currently in use and will also test new electricity meters before the power distribution companies install them for conformity to the standards. However, Umeme requested ERA to consider the corresponding costs to execute the meter testing within the tariff computation as operational costs for installed meters and capital costs. This will increase the cost of installation of electricity which is already high.

Other initiatives towards improving the quality of RETs include: a) Companies that access financing through UECCC are pre-qualified and must meet the Lighting Global certification<sup>13</sup>. So far, over 13 companies dealing in solar have been pre-qualified.; b) Uganda National Alliance for Clean Cooking (UNACC), is working with the UNBS towards defining some guidelines / benchmarks for cook stove performance and labelling (UNACC, 2015); c) In the Albertine region with support from WWF, NGOs (KIIMA Foods, RICE-WN and KCSO) are providing quality RETs (such as solar system and improved cook stoves) to rural communities.

### **2.3 Financing needs for scaling-up clean and renewable energy access in Uganda.**

The evidence on how much money is needed for scaling-up clean and renewable energy access in Uganda, is quite limited. The absence of updated energy sector investment plan makes it hard to estimate the amount of financing and investment in clean and renewable energy.

The estimates provided in the study are based on the Rural Electrification Strategy and Plan (2013-2022) and the Scaling-Up Renewable Energy Programme Investment Plan, which estimate that over USD 950 million and USD 455.1 million is needed by 2030, respectively (REA 2013 & Republic of Uganda, 2015a). However, it’s important to recognise that these estimates underestimate the broad financing in the renewable energy sector since they only cover rural areas and public sector funding.

According to the Rural Electrification Strategy and Plan (2013-2022), the global cost of implementing the plan is USD\$951.6 million, summarised in Table 2 and segregated into three general categories:

- i. On-Grid Electrification Financing, totaling to \$866.5 million, as the estimated capital cost of electric distribution system construction and customer densification, by service territory, including consumer densification within Umeme’s service area.
- ii. Off-Grid Electrification Financing, totaling to \$55.4 million, comprising the solar PV programme associated with the installation of 130,000 new solar home systems throughout the 13 service territories, the capital cost of islanded mini-grid projects estimated to add 8,500 new service connections and the cost of pre-investment support for advancing the development of larger distributed power generation facilities directly serving the power supply requirements of the on-grid electrification service providers.
- iii. Other Costs, totaling to \$29.7 million, including long-term technical assistance and training programme costs during the RESP period, the cost of ESP working capital grants to support start-up costs and ESP customer financing programme assistance relating to service connection fees, house-wiring and the purchase cost of electricity-using appliances and productive equipment.

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<sup>13</sup> Lighting Global maintains Quality Standards that set a baseline level of quality, durability, and truth in advertising to protect consumers. More details can be accessed at: <https://www.lightingglobal.org/quality-assurance-program/our-standards/>.

**Table 2: Financing requirements of the Rural Electrification Strategy and Plan**

<b>Funding Components</b>	<b>Amounts (USD Millions)</b>
On-Grid Electrification Financing	866.90
Off -Grid Electrification Financing	55.40
Other	29.70
<b>Total</b>	<b>952.00</b>

**Source:** REA (2013).

According to the SREP Investment Plan, the total estimated budget for implementing the SREP Uganda Investment plan is USD 455.1 million. SREP funds will be implemented by AfDB, WB and IFC. An amount of USD 33.8 million will be allocated to the geothermal project and will be divided between AfDB (USD 31.8 million) and IFC (USD 2 million). Project 2 will benefit from USD 9.4 million in SREP resources to be implemented by the AfDB, while Project 3 will absorb the remainder of SREP resources in the tune of USD 6.8 million which will also be implemented by AfDB. Table 3 shows the financing plan for the entire SREP Investment Plan.

**Table 3: Financing requirements for the Scaling-Up Renewable Energy Programme Investment Plan**

<b>Projects</b>	<b>GoU</b>	<b>SREP</b>	<b>MDBs</b>	<b>PS</b>	<b>DPs/ Others</b>	<b>Total</b>
Geothermal	7	33.8	70	230	48	388.8
Solar PV Off-grid Mini-grid and Net Metering	2.1	9.4	14.6	0	0	26.1
Wind Assessment & Pilot Wind Farms	5.4	6.8	14	0	14	40.25
<b>Total</b>	<b>14.5</b>	<b>50</b>	<b>98.6</b>	<b>230</b>	<b>62</b>	<b>455.1</b>

**Source:** Republic of Uganda (2015a).

Both strategies and plans show that there is need for significant scaling-up in investment from current levels, if Uganda is to achieve its electrification targets. There is specific need to increase funding support towards off-grid systems such as solar home systems or mini-grids in rural areas, because most Ugandans are in rural areas.

Mapping the finance landscape for renewable energy in Uganda is very complex, so, we have summarised in Table 4 some of the key financing needs for different players such as energy users, energy providers, financial institutions and government.

**Table 4: Example of finance needs and instruments by actor**

<b>Actor</b>	<b>Finance needs</b>	<b>Financial source or instrument</b>
Energy User	<ul style="list-style-type: none"> <li>– Paying for new energy products or service e.g. grid connection, monthly tariffs</li> <li>– Paying for related energy equipment e.g. fridges, TV, power tools, hairdryer</li> <li>– Paying for fuel, maintenance and repairs</li> </ul>	<ul style="list-style-type: none"> <li>– Personal savings</li> <li>– Local savings group</li> <li>– Government provided subsidy (e.g. lifeline tariffs, connection subsidies)</li> <li>– Loan e.g. from microfinance institution</li> <li>– Retailer finance scheme e.g. pay-as-you-go, pay-to-own.</li> </ul>
Energy Provider	<ul style="list-style-type: none"> <li>– Seed capital for early stage research and enterprise development e.g. concept design, feasibility analysis, piloting</li> <li>– Working capital e.g. to buy inventory</li> </ul>	<ul style="list-style-type: none"> <li>– Grants</li> <li>– Concessional Loans</li> <li>– Market-rate loans</li> <li>– Equity</li> </ul>

Actor	Finance needs	Financial source or instrument
	<ul style="list-style-type: none"> <li>– Investment capital for growth period</li> <li>– Solutions to address customer affordability gap</li> </ul>	<ul style="list-style-type: none"> <li>– Credit guarantees</li> <li>– Working capital fund</li> <li>– Consumer subsidy / business model innovation</li> <li>– Risk mitigation instruments e.g. political risk insurance</li> <li>– Results-based financing</li> </ul>
Financial Institutions	<ul style="list-style-type: none"> <li>– Concessional finance to channel finance to energy providers and users</li> <li>– Risk guarantees and risk mitigation instruments</li> <li>– Capacity development</li> <li>– Demonstrable and investable models</li> </ul>	<ul style="list-style-type: none"> <li>– Grants</li> <li>– Concessional loans</li> <li>– Credit guarantees</li> </ul>
Government	<ul style="list-style-type: none"> <li>– Policy and regulatory development: identifying and reforming policy, laws and regulations needed to attract investment e.g. feed-in-tariffs, product standards</li> <li>– Capacity building and training e.g. energy ministry officials, regulators, universities</li> <li>– Market development e.g. resource mapping, feasibility studies, business development services</li> <li>– Reforms to wider enabling environment e.g. rule of law, infrastructure, property rights</li> </ul>	<ul style="list-style-type: none"> <li>– Grants and loans from development finance institutions</li> <li>– Domestic taxes</li> </ul>

**Source:** Rai, N, Best, S and Soanes, M (2016).

## Section 3: Opportunities for Investment in Clean and Renewable Energy Access in Uganda

### 3.1 Supportive policy and regulatory framework

#### a. *Comprehensive National Development Planning Framework*

The Comprehensive National Development Planning Framework (CNDPF) provides for a 30-year vision to be implemented in three 10-year plans, six 5-year National Development Plans (NDPs), Sector Investment Plans (SIPs), Local Government Development Plans (LGDPs), and Annual Work plans and Budgets. The key target set out in the Uganda Vision 2040 is to increase electricity per capita consumption to 3,668kWh by 2040 by increasing national grid access rate to 80 percent with total installed generation capacity reaching to 41,738MW. Among the priorities of the NDP II (2015/16 – 2019/20) is investment in abundant renewable energy sources including hydropower and geothermal, so as to increase power generation capacity from 825MW in 2012 to 2,500MW by 2020 and expansion of the national electricity power grid network (Republic of Uganda, 2015b).

#### b. *International commitments*

Uganda is a signatory to the United National Sustainable Development Goal (SDG). SGD goal 7 is ensuring access to affordable, reliable, sustainable and modern energy for all. In addition, Uganda is among the 14 early movers in Africa that started the process for developing the Sustainable Energy for All (SE4ALL) Action Agenda which was launched by the United Nations (UN) Secretary General in September 2010 to achieve three inter-related goals by 2030 of: (i) providing universal access to modern energy services, (ii) doubling the global rate of improvement in energy efficiency, and (iii) doubling the share of renewable energy in the global energy mix by 2030. Uganda's SE4ALL initiative was officially launched in 2014 through validating its Action Agenda and setting quantitative indicators for the three goals (Republic of Uganda, 2015a).

#### c. *The Electricity Act, 1999 (Cap 145)*

The act governs the activities of the Electricity Supply Industry. The Act provides for the establishment of an Independent Regulator with the mandate to regulate the generation, transmission, distribution, sale, export, import and distribution of electrical energy in Uganda. The enforcement of the Act, is supplemented by Statutory Instruments and Guidelines approved by ERA. Other organs such as the Electricity Disputes Tribunal, the Rural Electrification Agency (REA) and Board (REB) were established under the Act to provide guidelines for resolution of sector disputes, promote, support and provide for rural electrification programmes, respectively<sup>14</sup>.

#### d. *Energy Policy 2002*

The guiding policy governing the overall energy sector in Uganda is the Energy Policy for Uganda 2002, with the goal of *“meeting the energy needs of Uganda’s population for social and economic development in an environmentally sustainable manner.”* In the policy, the GoU laces specific emphasis on the electricity supply industry, firstly; by seeking to make the power sub-sector financially viable and able to perform without subsidies from the government budget.<sup>15</sup>

*“The energy policy puts a lot of emphasis on initiatives to conserve biomass resources that include the promotion of improved stoves, as well as afforestation. However, the impact of these efforts is still limited” – MEMD Official.*

The energy policy is supported by other sub policies and strategies targeted towards promotion and sustainable use of renewable energy such as:

- i. *Renewable Energy Policy, 2007*; The overall objective of the policy was to increase the use of modern renewable energy so that its proportionate use increases from the then 3.8 percent to 61 percent of the total energy consumption by the year 2016. Among the special focus of the policy is to establish an appropriate financing and fiscal policy framework for RET investments (MEMD, 2007).
- ii. *Rural Electrification Strategy and Plan (RESP) 2013-2022*; The overall objective of the plan is to position the electrification development programme on a path that will progressively advance towards achievement of universal electrification by the year 2040, while ensuring the displacement of kerosene lighting in all rural Ugandan homes by 2030. The plan targets to achieve 26 percent rural electrification rate (i.e. consumers

<sup>14</sup> <http://www.era.or.ug/index.php/opportunities/investment/renewable-energy-investment-guide>.

<sup>15</sup> <http://www.era.or.ug/index.php/opportunities/investment/renewable-energy-investment-guide>.

who will be utilizing electricity in their homes, businesses or institutions) by 2022 from the current 7 percent.

- iii. *Biomass Energy Strategy, 2013*; Propose rational and implementable approaches to manage the biomass energy sector.
- iv. *Scaling-Up Renewable Energy Programme Investment Plan*; The SREP will assist the GoU in meeting the country's targets set in the United Nations (UN) SE4ALL Initiative to achieve three inter-related goals by 2030 by: promoting an increase in access to modern energy services for over 98 percent of the population and helping to double the share of renewables in the energy mix.
- v. *Energy Efficiency Strategy for 2010-2020*; The Strategy is strongly programmed and activity oriented, categorizing the five main areas of intervention into 'Pillars' of *Energy Efficiency*: Awareness and Information, Training & Education, Research and Development, Financing and incentives, and Legislation & Framework (MEMD, 2015).
- vi. *Renewable Energy Feed-in Tariff (REFIT)*; The REFIT is designed to provide price certainty to renewable energy generators. The policy covers a number of technologies and is attractive because it is based on the levelized cost of each technology and not the avoided cost. The priority renewable energy technologies for REFIT in Phase 2 include; hydro, bagasse, landfill gas, biogas, wind, biomass/ municipal solid waste (MSW) [ERA, 2018<sup>16</sup>]. According to ERA, REFIT applies to small-scale renewable energy systems, of prescribed priority technologies, up to a Maximum Installed Project Capacity of twenty (20) MW, and greater than 0.5 MW, as defined by the Electricity Act 1999.
  - a. "To encourage more financial investment in the sector, ERA adopted the REFIT-Renewable Energy Feed In Tariff which has promoted and increased the amount of electricity generated from renewable sources simply because when a fixed tariff is provided, the investor is guaranteed to have a stable tariff for a reasonable period of time like 20 years"- ERA official.
- vii. *Global Energy Transfer for Feed-in-Tariff (GET FiT)*; Working with the GoU and KfW, ERA developed the GET FiT programme in 2012 in order to increase Uganda's energy production to mitigate possible power supply shortages before the large hydro plants get online. The main purpose of the GET FiT Programme is to fast-track development of renewable energy generation projects of 1 MW – 20 MW promoted by private developers with a total installed capacity of about 170 MW/ 830 GWh per annum<sup>17</sup>.

### 3.2 Supportive Institutional framework

#### a. Public Institutions

There are a number of public institutions that support the renewable energy sub-sector in Uganda. The institutions and their roles are presented in **Table 5**.

**Table 5: Public Institutions in Uganda's Energy Sector**

<b>MDAs</b>	<b>Roles and Responsibilities</b>
Ministry of Energy and Mineral Development	The Ministry is responsible for energy policy formulation and oversees the operations of the electric power sub-sector.
The Ministry of Water and Environment	Directorate of Water Development is responsible for managing the water resources. It is the agency that awards surface-water permits (abstraction permits) to project developers.
Ministry of Finance, Planning and Economic Development	Responsible for mobilisation of resources and financing government energy projects.

<sup>16</sup> <http://www.era.or.ug/index.php/opportunities/investment/renewable-energy-investment-guide>.

<sup>17</sup> <http://www.era.or.ug/index.php/opportunities/investment/renewable-energy-investment-guide>.

<b><i>MDAs</i></b>	<b><i>Roles and Responsibilities</i></b>
Electricity Regulatory Authority	ERA is a corporate body established in April 2000 by virtue of the Electricity Act, 1999 (Cap. 145), as an independent sector regulator. Its main function is to regulate the generation, transmission, distribution, sale, export and import of electricity. ERA reviews and approves electricity tariffs.
Rural Electrification Board (REB)	This was established in 1998 to manage the Rural Electrification Fund. The secretariat of the REB is the Rural Electrification Agency. The REB, as the governing body of Rural Electrification Authority (REA), provides subsidies to support rural electrification projects.
Rural Electrification Authority (REA)	Established in 2003 with the mandate of managing rural electrification projects. Its key role is to increase the electricity grid coverage. REA provides policy advice to the REB, operationalisation of Uganda's Rural Electrification Strategy and Plan and administering the Rural Electrification Fund (REF).
Electricity Disputes Tribunal	Part XIII of the Electricity Act, 1999, provides for the Electricity Disputes Tribunal. This is a body concerned with the arbitration of cases in the electricity sector. Any stakeholder, who may not be satisfied with ERA's decisions, can appeal to the tribunal.
Generation, Transmission, Distribution companies	<p>Uganda Electricity Generation Company Limited (UEGCL) – Owns two generating power stations at Jinja – Nalubale and Kiira power stations. In November 2002, the UEGCL was privatised through a long-term concession of 20 years with ESKOM Enterprises (U) Ltd.</p> <p>Uganda Electricity Transmission Company Limited (UETCL) - UETCL is publicly owned, but operates as an independent and profit-making business unit. The key roles are: owner, investor and operator of transmission; power lines above 3kV in the country; system operator; single buyer for grid-connected generation, which is sold on to distributors; exporter to neighboring countries; and power-expansion planner.</p> <p>Uganda Electricity Distribution Company Limited (UEDCL) - UEDCL owns the distribution infrastructure operating at 33kV and below. It is responsible for the retail of electricity including metering and billing of consumers. UEDCL granted a concession (2005–2024) to Umeme to manage and operate the national distribution grid.</p>
Concessionaires	ESKOM, UMEME, Fersult, WENRECO, and URECL
Uganda Energy Credit Capitalisation Company (UECCC)	Government of Uganda owned company to promote private sector-led renewable energy infrastructure development; to provide transaction advisory services; to introduce innovative financing modalities.
Uganda National Bureau of Standards (UNBS)	Mandated to develop and promote standardisation, quality assurance, laboratory testing and metrology.
Local Governments (LGs)	These promote use of efficient energy technologies through sensitisation. However, there is no replica MEMD institution at LG levels; energy issues are handled by ENR department.
Other Agencies	<p>National Environment Management Authority (NEMA)- awards certificates of environmental clearance, following review and approval of Environmental Audits (EAs), Environmental Impact Assessment (EIA) Reports and Resettlement Action Plans (RAPs).</p> <p>Uganda Revenue Authority (URA) - is responsible for overseeing taxation related to the energy sector, as well as private investment in the energy sector.</p> <p>Uganda Investment Authority (UIA) -autonomous regulatory body to promote and facilitate investments in Uganda. The Authority also facilitates investment in Uganda's energy sector.</p>

<i>MDAs</i>	<i>Roles and Responsibilities</i>
	<p>The Public Procurement and Disposal of Assets Authority (PPDA)- It is responsible for drawing guidelines for procurement and disposal of government assets. Responsible for guiding the contractual process in Uganda's energy sector.</p> <p>Uganda National Bureau of Standards (UNBS) – UNBS is responsible for development and monitoring standards for renewable-energy technologies, in addition to biofuels technology.</p>

**Source:** Whitley Shelagh and Tumushabe Godber (2014).

**b. Development partners**

Uganda has a large community of international development partners in the energy sector. These are coordinated through the Energy and Mineral Development Partners Group (EMDPG) which Norway is leading. DPs represented in the EMDPG are: KfW, GIZ, USAID, DFID, EIB, EU-Commission, France, Ireland, IWF, AfDB, JICA, Norway and World Bank. In addition, other DPS supporting the Ugandan energy sector include: NORAD, IAEA, USTDA, IDB, UNDP, UNIDO, NDF and SIDA.

**c. Nongovernmental Organisations (NGOs)**

There are several NGOs working in the field of renewable energy at national level and Albertine region. Some of these include: WWF-UCO, Environmental Alert, IRDI, VEDCO, Rwenzori Eco Tourism and Disaster Management Organisation, KCSO, RICE-WN, KIMMA Foods, Sustainable Environment Awake (SEA), Conservation and Development Agency (CODEA), KAWODA, Good Hope Foundation, KIKA, Katara Women Poverty Alleviation. Most of them are promoting and providing various clean energy options which include: Solar PVs for lighting, phone charging and to a lesser extent, cooking and fridges; firewood liners that are specially built to save on the amounts of fuel wood used and improved cook stoves. Others are involved in policy advocacy on increasing access to renewable energy especially in the areas of standards, taxation and tariffs. For example, WWF-UCO together with her partners have engaged LGs to waive taxes/ levies on suppliers of RETs, especially solar and cook stoves.

**d. Private sector actors**

There are a number of private actors in the renewable energy sectors, some of them include: Eskom Limited, UMEME, Financial Trust Bank, MCoper, Centenary Bank, CEPA, Postbank, Solar Now, UNACC, UNREEEA, UREA, Ferdult, URECL, WENRECO, FINCA, MTN Solar Pay, and Barefoot. Majority of them are renewable energy providers and financiers. The term 'providers' spans a very wide range of functions in the supply chain: design, manufacturing, power generation, distribution and resale (importers, wholesalers, retailers), installation, and service repair. Financing involves provision of credit and soft loans to both providers and end-users of RETs.

### 3.3 Financially viable electricity sector

Over the past two decades, Uganda pursued energy sector reforms initiatives aimed at improving utility performance issues and according to a recent paper on the financial viability of utilities in 39 Sub-Saharan African countries, it was found that Uganda and Seychelles had a financially viable electricity sector (World Bank, 2017).

### 3.4 Funding opportunities

Variety of funding opportunities exist from domestic and international sources for investments in clean and renewable energy access in Uganda, some of them are presented in Table 6 and 7. Details are contained in Annex 2 and 3.

**Table 6: Domestic funding opportunities for Renewable Energy**

<i>Agency</i>		<i>Amounts</i>
<b>a</b>	MEMD	Budget allocation: UGX 1,826.50 Billion (2017/18)
<b>b</b>	Uganda Energy Credit Capitalisation Company (UECCC)	Solar Loan Product - US \$ 1.5 Million
		Solar Financing framework for Tier 4 financial institutions - UGX 1 billion
		Solar Working Capital Facility - US \$ 8.5 Million
		Connection Loan Programme - UGX 1 billion

<i>Agency</i>		<i>Amounts</i>
		The Biomass Refinance Facility - UGX 210 million
		ORIO Mini-Hydro Power Projects UGX110 Bn
		Technical Assistance - Euro 1.5 million
<b>c</b>	Development Banks	<ul style="list-style-type: none"> <li>UDB – funding for mini-hydro &amp; solar energy plants and solar powered systems.</li> <li>AfDB - Energy portfolio accounts about 14 percent of the entire portfolio (USD 1.1 billion).</li> </ul>
<b>d</b>	Development Partners	World Bank - US\$ 256.9 million (committed) <sup>18</sup>
		The projects include: <ul style="list-style-type: none"> <li>Uganda Rural Electrification - US\$ 13.7 million</li> <li>Uganda Grid Expansion and Reinforcement Project (GERP) - US\$ 100 million</li> <li>Uganda Energy for Rural Transformation III - US\$ 135.0 million</li> <li>UG GEF Energy for Rural Transformation III - US\$ 8.2 million</li> <li>GPOBA: Uganda Energy for Rural Transformation - US\$ 0.03 million</li> </ul>
		European Union - EU-ACP Energy Facility (EUR 10.6M)
		SIDA Uganda programme (2016-2020) USD 4.6 million
		WWF – USD 2-3 million annually for REs
	United Nations Development Fund (UNCDF)	Clean Start Programme (2012 – 2018)- \$1.8M (grant funding) and \$3 M (leverage)
<b>e</b>	Global Energy Transfer Feed in Tariff (GETFiT) Programme	GETFiT programme - EUR 93.6 million (committed)
<b>f</b>	Financial Institutions and Private Sector	<ul style="list-style-type: none"> <li>Post Bank - provide credit to the public and private sector to acquire renewable energy equipment.</li> <li>Centenary Bank; loaned over UGX 1.5 billion</li> <li>FINCA - Bright Life Finca; invested over 0.5 million and raised 0.5 million from donors.</li> <li>M-Kopa - Invested over USD 30 million.</li> </ul>

**Source:** Author's calculations based on Document review and key informant interview.

**Table 7:** International funding opportunities for Renewable Energy

	<i>Agency</i>	<i>Amounts</i>
a.	Acumen	USD 7M – 10M (3 Years)
b.	DFID (private sector investment and innovation in low cost, clean energy technologies)	Africa Enterprise Challenge Fund - £49 M
		EEP - £27.5 M
		RBF - £40 M
	DFID (Energy Africa campaign)	Transforming Energy Access - £65 M
		Africa Clean Energy (ACE) - £65 M
		Power Africa and Shell Foundation USD 36 M
c.	UNCDF's	Clean Start - US\$26 million
d.	Bamboo Finance	US\$ 20 million (5 years)
e.	Cross Boundary	US\$200 million (5 years)
f.	Embark Energy	\$4.5 million
g.	Energiya	\$750 million (5 years)
h.	Fenix International	\$287 million
i.	Gray Ghost Ventures	USD \$50 million (5-6 years)

<sup>18</sup> Accessed from [http://projects.worldbank.org/search?lang=en&searchTerm=&countrycode\\_exact=UG](http://projects.worldbank.org/search?lang=en&searchTerm=&countrycode_exact=UG).

	<i>Agency</i>	<i>Amounts</i>
j.	Invested Development	\$20 million
k.	Liberia Energy Network	Distribute over 200,000 "plug and play" solar LED lighting and cell phone charging units
l.	Mosaic	US\$125M (5 years)
m.	Schneider Electric	venture capital to off-grid energy SMEs- USD 60-80 million (5 years)
n.	Sunfunder	US\$ 120 million (5 years)

**Source:** Author's calculations based on Document review.

These financing can be accessed through:

- i. *Public funding.* Through the MEMD, REA, ERA, UECC, among others;
- ii. *Debt or equity.* These may include; mezzanine finance, senior debt, project finance, venture capital and dedicated funds. The majority of debt financing is being provided by international finance institutions (IFIs) and development finance institutions (DFIs), including the International Finance Corporation (IFC);
- iii. *Grants* - some organisations provide funding to private sector and NGOs to enable them reduce the risks of investing in RETs, especially those targeting low income earners and in remote areas;
- iv. *Credit facilities* - some financial institutions are providing credit to companies, agencies and users to invest in RETs;
- v. *Climate finance.* They can act as a catalyst for the financing of renewable energy projects in Uganda. Several dedicated climate finance initiatives such as; Global Environment Facility (GEF), Climate Investment Funds (GIF), and Green Climate Fund (GCF) have already been channeling climate finance to developing countries. The GCF's Private Sector Facility could be used to create a risk mitigation facility dedicated to supporting renewable energy projects;

**Box 3:** *Enablers for targeting finance towards renewable energy financing: Lessons from Bangladesh and Nepal.*

Both Bangladesh and Nepal implemented a wide range of incentives that encouraged policymakers, practitioners, investors and communities to develop renewable energy projects.

Some of the key lessons Uganda can emulate include:

- a. **Policy enablers:** such as fiscal incentives. e.g. incentives were created to encourage renewable investments such as reduction in import tariffs and lower taxes on renewable energy products.
- b. **Economic enablers** for a range of energy access actors – investors, providers, support services and users. e.g. access to concessional finance by commercial banks for on-lending to suppliers or microfinance institutions. There is a regulatory requirement for Bangladesh commercial banks to invest a proportion of their lending to ‘greener project’ which also offers a policy incentive.

Actors lower down the value chain such as microfinance institutions, NGOs and suppliers encouraged to engage in the renewable energy market by the provision of low interest credit. Suppliers and manufacturers of Bangladesh also see benefits of engaging in this market due to available tax holidays and exemptions on local production and use of renewable products. End-users finally receive financial benefit in form of grants and microfinance loans.

- c. **Regulatory push by central banks:** The central banks use their regulatory roles to encourage private sector investment. The green banking circular of Central Bank of Bangladesh, for example, mandates commercial banks to allocate 5 per cent of their lending to green investments. Such regulatory push in combination with financial incentives, such as low cost loans, encourages mainstream banks to explore untested territories that rest outside their comfort zones.
- d. **Dedicated agencies to aggregate funds and projects:** Dedicated ‘*special purpose vehicles*’ (SPVs) – or agencies – are very useful as they have specific capacities and a mandate which enables them to draw down resources from donors and governments and channel them to lots of small-scale projects and actors. This model works well in case funders or investors are reluctant to channel funds to many small renewable energy projects due to high transaction costs. In addition, the one-stop-shop role model of the special purpose agency is not limited to finance, but also includes a variety of services aimed at helping to create markets and delivery networks. These provide access to capital, quality assurance, after-sales services, training and institutional support; thus offering a package of services that support and sustain the market and environment for renewable energy projects.

**Source:** Rai, N, Best, S and Soanes, M (2016).

### 3.5 Carbon financing

Renewable energy electricity projects (such as hydro etc) licensed by Electricity Regulatory Authority (ERA) are eligible to generate carbon credits and in turn earn additional revenue through the Clean Development Mechanism (CDM). To promote development of renewable energy, the revenue inflow to the subject project from the sale of carbon credits does not affect the Feed in Tariffs downwards (ERA, 2014). Eight projects in Uganda are registered under the CDM. These include: West Nile Electrification Project (WNEP); Uganda Municipal Waste Compost Programme; Bujagali Hydropower Project; Anaerobic digestion and heat generation at Sugar Corporation of Uganda Limited; Up Energy Improved Cook stove Programme Uganda; Accelerating Electrification through Grid Extension and Off-Grid Electrification in Rural Areas of Uganda; Mpanga 18 MW Run-of-River Hydropower Project; and Institutional Improved Cook Stoves for Schools and Institutions in Uganda.<sup>19</sup>

### 3.6 Potential of oil and gas revenues

Uganda made significant discoveries of oil and gas. Oil reserves stood at an estimated 6.5 billion barrels in 2015 (of which 1.4 billion barrels were economically recoverable) (URA and MoFPED, 2015). However, the larger part of revenue from these is not expected until 2020 when full-scale production commences. Nevertheless, Government of Uganda has been getting some revenues from mainly capital gains tax (MoFPED, 2015). The Committee on

<sup>19</sup> <http://cdm.unfccc.int/Projects/projsearch.html>; accessed on 25<sup>th</sup> April, 2018.

Commissions, Statutory Authorities and State Enterprises (COSASE) of Parliament established that government had so far received USD 709 million (UGX 2.6 trillion) as revenues from oil and gas related activities (Parliament of Republic of Uganda, 2017). Oil and gas revenues can provide potential funding for RE projects, for instance, some of these funds have been used to finance energy related projects, especially co-financing of Karuma and Isimba hydro dams.

### 3.7 Investment in off-grid

Off-grid electrification takes two main forms - standalone home energy systems and mini-grids. Although mini-grids have been used for electrifying rural villages for at least two decades, it is standalone systems that are now far more common (PwC, 2016). The off-grid power systems include; stand-alone PV systems, back-up systems, dry cell batteries and battery based systems. The size of systems varies from basic Pico-PV lighting systems to Solar Home System (SHS) installations that can power devices such as; phone charging systems, televisions, fans and fridges. Although relatively small in terms of overall quantity and though not easily included in national statistics, off-grid power systems provide good opportunities for increasing access to energy. The ongoing affordability challenge means that off-grid systems are the way to go. Households on as little as USD 1–3 per day income can often afford a solar lantern, while those on USD 3–5 a day can pay for a small solar home system that can run three to four lights, charge a phone, or run a radio (Rai, N, Best, S and Soanes, M, 2016).

*“Off-grid solutions will be the best option for many rural and remote areas in order to meet the 2030 targets”- WWF, 2015.*

The growth of off-grid electrification has been led by public initiatives such as the Rural Electrification and Renewable Energy Project in Bangladesh or commercially-driven, with financing funded either by 100 percent upfront cash payment by customers or through pay-as-you-go (PAYG) schemes or long-term leases (PWC, 2016). In Uganda, part of the success of standalone home systems has been due to the strongly customer-centric focus of PAYG SHS companies. There is spread of customer-financing business models such as pay-as-you-go (PAYG) for solar home systems in Uganda with companies such as M-Kopa and Solar now which are at the forefront, using payment systems such as Mobile Money.

#### ***Box 4: Standalone electrification for rural housing in the Eastern Cape, South Africa.***

Off-grid solar home systems are being installed in 1700 rural households in the Eastern Cape region of South Africa. They comprise a 90W rooftop solar PV panel and storage battery to deliver enough energy to power six indoor LED lights for up to four hours per day and two external LED security lights for 12 hours. They are also capable of powering a DC 32-inch TV set for five hours as well as providing mobile phone charging for five hours via two 7A ‘cigarette lighter- type’ sockets. The systems can be expanded, with additional solar panels and batteries, to cater for a DC refrigerator, washing machine and a sewing machine. Payment for the solar electrification project comes from a government-funded electricity grant previously earmarked to assist home owners in paying for Eskom generated power. The project was commissioned by the Mbhashe municipality at Dutywa in conjunction with South Africa’s Department of Energy (DoE).

***Source:*** PWC (2016).

#### ***Box 5: Ghana Solar-powered mini-grids bring security and new economic opportunities.***

Ghana provides electricity for 83% of its population, the second highest rate in Sub-Saharan Africa, but connecting isolated areas to the grid has proved very difficult. The solution: investing in solar-powered mini-grids like this one, built with support from IDA, the World Bank Group’s fund for the poorest. In the towns around the Volta River, 10,000 Ghanaians now enjoy uninterrupted power, which enhances security and brings new economic opportunities.

***Source:*** World Bank (2018).

## Section 4: Constraints Limiting Financing and Investment for Clean and Renewable Energy in Uganda

In this section, we discuss the factors that hinder finance from being channeled towards investments in renewable and clean energy access in Uganda at international, national and local levels.

### 4.1 International Level

There are many barriers which hinder international finance being channeled into clean and renewable energy access in Uganda. Some of these include:

- a) *Preference for loans versus grants*; The finance needs of the renewable energy sector require a mixture of grants, loans and equity, both concessional and commercial. But at the early stage of project development, there is a particular need for grant financing. However, one of the key barriers is that international energy funds have been using loans rather than grants, and this makes it harder to prioritise renewable energy in low income countries like Uganda. The current trend shows an overemphasis on credit-based instruments which tend to be focused on large-scale power projects (such as Bujagali and Karuma Hydropower) because loans are expected to be paid back. Multilateral Development Banks (MDBs), which are the funders of renewable energy projects, instead favour loan-based instruments owing to their long standing expertise in channeling debt-based instruments, as well as donor preference for credit-based financing (Rai, N, Best, S and Soanes, M, 2016).
- b) *Approaches of financial intermediaries*; The type of agencies that channel funds also determine what type of project gets funded. Substantial amount of funds are being channelled through development banks and UN agencies. However, development banks have a stronger inclination to invest in large-scale projects because of higher transaction costs in funding lots of small renewable energy projects (Rai, N, Best, S and Soanes, M, 2016).
- c) *Aggregation*; The sums of finance often required by renewable energy enterprises in their start-up phase are often too small for mainstream investors, banks, or even international donors. The transaction costs of funding many small projects are high because of the due diligence and bureaucracy involved. There is a lack of aggregators able to package up many small projects as a way of lowering overall financing costs or helping to obtain finance<sup>20</sup> (Rai, N, Best, S and Soanes, M, 2016). Aggregating smaller-scale renewable energy assets can help scale up investment volume and reduce due diligence costs per project for institutional investors. However, institutional investors in developing countries may lack the capacity or mandate to form an in-house investment team to perform the due diligence, structuring and negotiations required for direct investment (IRENA, 2016).
- d) *Risk*; Risks associated with political events that adversely impact the value of investments (e.g. war, civil disturbance, currency inconvertibility, breach of contract, expropriation, non-honouring of obligations). The use of political risk mitigation instruments thus can play a key role in attracting private capital. Although international financial institutions are well positioned to mitigate investment risks, they have dedicated only about 4 percent of their total infrastructure risk mitigation issuance value to small-scale renewable energy. According to a study by IRENA, most institutions claim to have no experience in deploying risk mitigation instruments for renewable energy projects. Guarantees have been used mainly to support larger-scale projects such as Bujagali hydropower project (IRENA, 2016). However, small generation companies in renewable energy find it hard to obtain a political risk guarantee as opposed to large developers (ERA, 2008).
- e) *Investor returns and short-termism*; Investments in low income energy markets like in Uganda are often longer-term, higher risk, and generate a lower financial return. Commercial investors may be unwilling to spend time building the relationships and market demand required to generate a decent return, requiring more 'patient' forms of capital instead (Rai, N, Best, S and Soanes, M, 2016).
- f) *Cost of doing business*; Doing Business report of the World Bank ranks Uganda's economy in the position of 122 out of 190 economies (World Bank, 2018<sup>21</sup>). Uganda is behind Kenya and Rwanda which are ranked at 80 and 41, respectively. Uganda scored poorly in the categories of getting electricity, starting a business and dealing with construction permits. Uganda's low ranking affects global investor confidence investing in Uganda including investing in renewable energy.

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<sup>20</sup> Aggregation is a generic term which refers to financial clustering mechanisms that allow projects to be bundled together.

<sup>21</sup> <http://www.doingbusiness.org/data/exploreeconomies/uganda>.

- g) *Lack of sound investor knowledge of the Ugandan market;* Despite the fact that Uganda has a Uganda Investment Authority which is mandated with marketing the investment opportunities in the renewable energy sector, the country is still grappling with attracting investors. This is partly attributed to perceived and actual risks most investors have on Uganda which include, among others; regulatory uncertainty, corruption, currency risks, low investor returns and unproven business models.

## 4.2 National level

### a) *Policy and regulatory environment.*

The policy and rules around investing in renewable energy is at times unfavourable or confusing. For instance.

- Renewable Energy Policy, 2007 establishes a Standardised Power Purchase Agreement (PPA) and Feed-in Tariffs for renewable energy generation projects. However, the role of government in the off-grid market is not clear hence creating grey areas in coordination and implementation of strategies for off-grid energy access.
- UETCL is a sole bulk buyer and seller of electricity in Uganda. However, most lenders are concerned about the ability of UETCL to pay. Some lenders think that the cash flow of UETCL is not strong. Moreover, there is a currency risk as the revenues from UETCL are in Uganda Shillings whereas loans are mostly denominated in US dollars.
- The Electricity Act 1999 limits individuals in rural areas that have excess of power generated and are willing to distribute it to their neighbours. One is required to apply for an abstraction permit and the processes involved are too laborious hence demoralise such individuals.

### b) *Institutional weakness*

The liberalisation of the energy sector led to the creation of a number of institutions like ERA, REA, UETCL, UEDCL, UEGCL, and UECCC among others. Apart from the high costs of running these institutions, some of them have conflicting mandates and sometimes, there is duplication of their work, for instance REA and UEDCL. The large number of institutions raises the administrative costs which translate into the high electricity tariffs. There are also management challenges, although UETCL, UEDCL, and UEGCL are under the MEMD, they are by law managed by MoFPED.

The proliferation of institutions has led to unnecessary bureaucracy and lent seeking behaviour. Energy projects require authorisation and clearance, however, bureaucracy, especially by these agencies, drag investment projects. Sometimes, bureaucracy is promoted by corruption and lent seeking behaviour, as exhibited in the negotiations of power purchase agreements and concessions of Bujagali Power Project and UMEME. This has a negative impact on the efficiency and effectiveness in the delivery of energy projects in Uganda.

There are also capacity challenges in these institutions to manage and supervise various energy projects. Some staff of these agencies are not conversant with some of the technologies being proposed which leads to problems in approving their proposals.

### c) *Fragmented funding landscape and a scattergun approach to projects*

At the moment, there are many sources of possible funding, from private sector, multilateral institutions and from bilateral donors, but this has resulted in a fragmented funding landscape and a scattergun approach to renewable energy projects. Some of the respondents talked to during this study, noted that there are many development partners supporting the renewable energy sector, however, they are not well coordinated and some of their interests are hurting the industry.

*“...each partner brings to the table something different. It’s in rare occasions that all partners come together and deliver on a given project like the GETFiT project that brought together EU, World Bank and other partners to support generation projects across the country.”- MEMD Official.*

d) *Taxation and subsidies.*

Most tax and subsidy regimes favour large-scale electricity generation rather than small-scale renewable energy projects. For instance, under the Income Tax act 2017, Government granted Bujagali Power Project a corporate tax exemption for 5 years. In addition, the move by East African Community (EAC) to restrict the duty exemption on solar goods to those related to solar generation (with the risk of consequently affecting VAT exemption as part of a national interpretation), thus excluding solar accessories, resulted in increasing the cost of a Solar Home Systems (SHS) by 20% (DFID & MEMD, 2016). Furthermore, tax administration is not streamlined with resulting gaps in the interpretation, application and enforcement. Thus, the application of the taxes is subject to the personal interpretation of the customs officer in charge of the control for new products without Harmonised System (HS) code (DFID & MEMD, 2016).

*“In July 2016, they changed to EAC laws and introduced duty and VAT which raised prices to about 20% and this is affecting rural people. Most of companies are not profitable and this is preventing the whole industry from growing.” – MKOPA.*

- e) *Government focus on mainly hydroelectricity.* By investing heavily in on-grid large-scale hydroelectricity projects (Isimba, Karuma, Ayago, Muzizi, and Nyagak), government is sending the signal to investors that small-scale energy projects are of low priority. In 2017/18, the large hydro infrastructure was allocated over two-thirds of the MEMD budget. Investment in large hydro infrastructure is not bad since they bring about an increase in electricity production, but they deliver minimal benefits to low energy consumers. This is mainly because large renewable energy projects are mostly grid-connected which may not translate to an increase in energy access for most rural population.

**Box 6:** *Kenya’s Powerful Last Mile Connectivity Programme.*

Kenya is embracing electrification as a flagship endeavor, with a focus on the distribution sector reaching all Kenyans with energy services by 2020. It has already emerged as a star in achieving progress on electrification—growing from 23 percent in 2009 to about 50 percent in 2016 underpinned by huge investments across the sector value chain. Today, there are about 5 million Kenya Power and Lighting Company (KPLC) consumers, with more than 1 million consumers added annually in the past two years.

The government’s primary grid densification vehicle - the Last Mile Connectivity Programme (LMCP) - seeks to connect all consumers within 600 meters of a transformer. It is supported by close to \$700 million in donor resources (including the World Bank-financed Kenya Electricity Modernization Project) to speed up access in grid connected areas. Since Kenya’s grid is almost exclusively concentrated in the central corridor where there is the highest population density, this approach is considered the least cost way of harnessing economies of scale in network design with a potential of reaching about 70-80 percent of consumers.).

Kenya is also leading the way on how to balance a rapidly growing electrification programme with consumer affordability in a financially sustainable manner. The LMCP design encompasses a substantial decrease in the connection fee charged to household customers - from KES 35,000 (\$343) to KES 15,000 (\$147) (to be paid in instalments). However, such consumer connection charges are insufficient to cover the connection costs (of \$1,000/connection) borne by KPLC. These new households are overwhelmingly low volume consumers paying a lifeline tariff and are cross-subsidized by other consumers in KPLC’s overall revenue requirement to ERC.

Initially, KPLC shouldered the gap with commercial loans, but this imposed an increasing burden on the utility’s finances. There is now a two-pronged approach: (i) in 2015, a World Bank Guarantee supported KPLC to restructure \$500 million of short-term expensive commercial debt into a long-term maturity loan; and (ii) concessional debt by the donors to the government is being on-granted to KPLC for electrification purposes, thereby keeping the debt off KPLC’s books.

**Source:** *World Bank (2017).*

Even with the best intentions, on-grid electrification through hydroelectricity is insufficient to justify further investment in grid extension. This is partly because of the mismatch between grid expansion costs and affordability to low-income customers. This suggests that alternatives to further grid coverage need to be developed -as Kenya showed in its Last Mile Connectivity Programme (see *Box 6*).

*f) Low absorption of funds*

Although the energy sector is among the most funded sectors in the national budget, the inability of the MEMD to effectively and efficiently spend the allocated funds is a big issue of concern. For instance, according to MoFPED (2017), during FY 2016/17, the MEMD was allocated UGX 2,418 billion, however, only 59 percent (UGX 1,427 billion) was spent. In particular, under Rural Electrification of the UGX 310 billion that was allocated, only 62 percent (UGX 185 billion) was spent. This is partly attributed to delays in procurement and delays in acquisition of land for way leaves/ right of way of line transmissions for and compensation of Project Affected Persons (PAPs). This challenge is exacerbated by inadequate funding for activities such as; Resettlement Action Plans (RAPs) for transmission and rural electrification projects and speculative tendencies by some government and well-connected people who acquire land in anticipation of government projects.

*g) Shortage of proven business models and good quality business plans.*

Funders are looking for proven business models and well-developed business plans, a clear understanding of risks and returns, and an indication that risks are being managed. While there are market pioneers on energy access, many providers still need to prove their business model and to demonstrate scalability and replicability, which takes time. Although this is being addressed by UECCC through an Early Stage Support programme funded by KfW, it is still on a small-scale.

*h) Inadequate financing and access to credit*

Most of the potential developers are aware of the available financing opportunities in the country, however, the lending capacity of the Development Banks e.g. East African Development Bank (EADB) and Uganda Development Bank (UDB) seems to be constrained by their limited net worth. In addition, local financial institutions also have limited awareness and interest in promoting RETs loans in the context of their wider loan products, and may see new technologies and products as having high levels of risk. Thus local financial institutions prefer lending short-term<sup>22</sup>, yet energy projects are long-term.

*“...the market growth for RETs, especially solar in Uganda is currently completely reliant on the level of finance companies we can secure... the greatest need is access to working capital” – Solar Company Official.*

Furthermore, renewable energy companies, project developers and end-users (households and commercial enterprises) often lack awareness of available energy financing. For instance, UECCC is providing credit through commercial banks such as Centenary Bank, Barclays Bank Uganda, Stanbic Bank Uganda, Finance Trust Bank, and Postbank Uganda, which are largely in urban centers and whose terms and conditions for accessing loans may be not convenient to small-scale RET providers. The challenge is that most financial institutions are not doing enough to advertise these loan products. With UECCC technical support, the responsibility of marketing the loans is largely placed in the hands of the PFIs, however, most of them are not doing it. Even UECCC acknowledges this challenge: *“...we have not done very well in the area of publicity of the available credit facilities in the PFIs...this is an area we are aware of and working to improve”*- UECCC Official.

*i) Poor quality product and inadequate enforcements of standards*

The low consumer demand for RET is partly attributed to market penetration by low-quality RET (especially solar technologies and batteries). Some consumers complain about the sub-standard meters installed by Umeme and UEDCL at their premises. Several renewable energy products and services still lack standards, and the quality control by UNBS is inadequate. The challenge is that UNBS is thin on ground to control and enforce the standards and ensure that all RETs imported into the country meet quality standards. Another challenge is that most people lack information on where to get quality RETs. In most cases, they are duped by conmen who sell them poor quality products.

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<sup>22</sup> most of the commercial banks prefer lending up to a period of five years loan maturity though they can stretch up to seven-year maturity under exceptional circumstances.

*“The market is still blinded by information. I know that they have tried to put associations for solar dealers and renewable energy institutions to try and disseminate information but unfortunately, dealers are business-oriented than social-oriented... I would be happy to see a non-profit or government institution driving this information on how the technology works and the possible financial savings attached to the market” – Commercial Bank Official.*

*j) Low electricity demand*

The current electricity access policy is driven by grid expansion and densification, however, investment in renewable energy is being affected by low power consumption and limited capacity of Ugandans to pay for electricity. Low demand coupled with high costs of energy projects discourages investors from committing their funds to projects in the renewable energy sector (CSBAG, 2014). The low demand is exacerbated by the minimal investment on the demand side; increasing the ability of the consumers to utilise the electricity. The associated costs of service and connections is still high, which leads to underutilisation of completed electrification projects in rural areas.

*k) High cost of electricity*

The recent government efforts to scale up electrification is being hampered by the high electricity tariffs (Shs718.75 for domestic and Shs369.5 for larger and industrial) and unreliable supply. Most households in Uganda cannot afford the costs of connection to the grid and later on pay for the electricity. Government has recognised this challenge and is devising means to address it such as; refinancing of Bujagali Energy Limited loans with cheaper options to reduced power tariffs. However, according to ERA,<sup>23</sup> low consumption and high capital investments (in terms of loans) will keep the cost of electricity high. This is mainly due to the fact that large hydro power projects were or are being constructed using loans some of which are none concessional. It's important to note that electricity tariffs are based on recoveries (of funds invested) to generate, transmit and distribute electricity to the consumer. Another factor contributing to high electricity tariffs is high electricity losses, which currently stands at 17.9 percent which is above ERA's target of 14.7 percent.

*l) Inadequate skilled personnel*

Uganda currently has a shortage of qualified people to work on renewable energy projects. For instance, eenergy project developers experience problems finding local skilled labour, especially in the area of hydropower development. This is manifested in the ratio of engineers to projects which is 1:3. In addition, there is a shortage of qualified and licensed technicians and wiremen. This study found that Uganda currently has only 950 licensed technicians and wiremen, yet the Electrification Policy targets connecting 300,000 households annually for the next five years. Although there has been some efforts by government with support of DPs (i.e. GIZ and JICA) to train technicians specifically in the solar technologies, however, this is on a small-scale.

### **4.3 Local Level**

There are a number of challenges in investing in renewable and clean energy access at local government levels. The challenges discussed below are largely based on findings from the Albertine region where the study was conducted.

*a) High initial costs of off-grid systems*

The high upfront cost associated with off-grid electricity technologies and limited access to consumer financing options is a challenge to the utilisation of RETs. Despite the fact that some financial institutions are providing credit for acquisition of RETs, especially solar systems, most of them are concentrated in urban areas. Existing micro-finance institutions often have a narrow credit product line and limited experience in rural markets. This slows down adoption of these technologies in rural areas.

*b) Poor quality products*

Due to low purchasing power, most consumers of RETs tend to purchase low quality technologies which in most cases are not durable. This is compounded by the fact that the market for RETs is not well regulated, which makes it hard for the consumer to find quality products on the market. The influx of poor quality RET products makes it hard for genuine and quality dealers and suppliers to do business.

*“...I sell a solar lighting system of 4 lights at UGX 200,000 but in the market, there are similar systems at UGX 100,000. So, people shun some of these products” - CBO leader.*

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<sup>23</sup> <http://www.monitor.co.ug/Business/Electricity-tariffs-stay-high-ERA/688322-4487918-vnkea/index.html>.

c) *Weak marketing and maintenance systems*

There are limited distribution centres of off-grid systems. Most suppliers of off-grid electricity technologies such as solar photovoltaic (PV) systems are concentrated in urban centers. This is mainly due to limited outreach capacity of the distributors, limited financing and human resources, poor infrastructure (roads and telecommunication) and lack of market intelligence. Thus, end users have to travel long distances to purchase and sometimes repair RETs, which is difficult for most end users.

d) *Inadequate funding at local government levels*

Local governments do not have any budget allocation for increasing access to clean and renewable energy. The district officials talked to noted that they depend on development partners, and NGOs to undertake clean and renewable energy activities, however, the funding is also small and unsustainable. In addition, LGs lack personnel in the energy sector, partly because energy is not among the key sectors of the LGs. The major challenge is that the energy is not decentralised (no replica department of MEMD at LG level), like other sectors.

*“...although energy is mainstreamed in the District Development Plan, but we don’t have a budget line in the annual budget to implement the planned activities” – District Official, Arua DLG.*

e) *Poor credit cultures and theft*

RETs suppliers, especially those providing SHS complained of increasing rates of fraud through which some customers tamper with the kit in a bit to default on payments. This is worsened by the fact that the country does not have a clear identification and credit reference system to track consumers’ locations and behaviour.

f) *Inadequate capacity*

There is limited local technical capacity to handle off-grid systems. The technical capacity to design, install, operate and maintain off-grid systems is very limited which in some cases leads to system abuse and premature breakdown of systems and poor maintenance. This discourages most end users from using RETs.

*“A person can have a battery issue which requires some little wiring adjustments but they will wait until the supplier is servicing so as to have such a problem rectified. This reduces access” – DLG Official.*

g) *Practice, knowledge and attitudes*

There is limited knowledge of RETs (such as solar and efficient cook stove), their use and applicability. Many households have a wrong perception that some RETs such as solar is for rich people, since it’s expensive. Others are still stuck in the traditional way of cooking which makes use of some RETs such as cook stoves inappropriate. In addition, there is lack of awareness of good quality products amongst end users: households, NGO, public institutions, communities, businesses. Even those who are aware, have no clear redress mechanism since the consumer protection bill has never been passed.

## Section 5: Conclusions and Recommendations.

### 5.1 Conclusion.

The study investigated the opportunities and challenges for unlocking financing and investments for clean and renewable energy access in Uganda. The study found that renewable energy is most prevalent in electricity generation, with about 80 percent of Uganda's electricity coming from mainly hydropower. Other renewables, especially solar, and biogas take a very small proportion of the financial investments, yet these could be more accessible and affordable by most Ugandans.

Renewable energy will continue to play a very important role in the supply of sustainable, clean and modern forms of energy to meet Uganda's ever-increasing demand for energy. A number of opportunities exist to support the financing and investments in the renewable energy sector. Some of them include: supportive policy, regulatory and institutional framework; and funding from domestic and international sources. However, investments by government, development partners, private sector and NGOs in access to renewable and clean energy technologies is still insignificant and hence have not had much effect on reducing the trend of consumption of biomass energy.

There are number of factors that are hindering financing and investments in the renewable energy sector, some of them include: Low demand and high cost of electricity; Inadequate financing and access to credit; weaknesses in the policy, regulatory and institutional frameworks; inadequate funding at local government levels; and inadequate knowledge and poor attitudes towards RETs.

It's against this background, that we propose the following recommendations.

### 5.2 Recommendations.

In line with the constraints discussed in section four that are limiting financing and investment for clean and renewable energy in Uganda, the study proposes the following recommendations:

#### *a. Low demand and high cost of electricity*

- i. MEMD should work towards reducing electricity tariffs for all electricity consumers through:
  - a. Soliciting for cheaper financing options (grants or concessional loans) for any energy projects;
  - b. Reducing electricity losses from the current 17.9 per cent to single digits;
  - c. Reducing the feed-in tariff rates over time as renewables become more cost competitive with traditional energy sources.
- ii. MEMD should increase funding in energy efficiency improvements. Improving energy efficiency in homes, businesses, schools, governments and industries is one of the most constructive, cost-effective ways to address the challenges of high energy prices, energy security and climate change. According to Harris J.M. & Roach Brian, 2016, investments in energy efficiency are typically much cheaper than meeting demand growth through developing new energy supplies. Energy efficiency improvements can be obtained by technological changes such as; using energy efficient bulbs, machinery and appliances. It can also be achieved through changing behaviour, such as switching off lights and appliances when not in use.
- iii. Government needs to ensure that there is continued growth in electricity consumption, especially by manufacturing through the implementation of the planned 25 industrial parks in order to create a multiplier effect.

#### *iv. Inadequate financing and access to credit*

- v. MEMD should work with the Bank of Uganda, the MoFPED and financial institutions to simplify lending requirements and repayment process for RETs for example, using solar systems as collateral, supporting mobile money integration for solar companies and MFIs.
- vi. MoFPED should work with development partners to devise appropriate financial instruments such as combining grants with loans in new areas of investment. Grants can be used to develop capacities for renewable energy developers, whereas concessional loans and guarantees can be used to make the sector more profitable for mainstream investors.
- vii. MoFPED should invest some funds from oil revenues and environment duties into off-grid renewable energy options.

- viii. MEMD should solicit for Climate finance (such as Global Environment Facility (GEF), Climate Investment Funds (GIF), and Green Climate Fund (GCF)), and International Solar Alliance<sup>24</sup> to finance renewable energy projects. The GCF's Private Sector Facility could be used to create a risk mitigation facility dedicated to supporting renewable energy projects.
- ix. Renewable energy providers and companies should transform themselves from energy service companies to project developers with financing capacity and expertise that work to accelerate the delivery of renewable energy projects.
- x. Financial institutions should look at provision of RETs as a corporate social responsibility in a bid to mitigate the effects of climate change. Thus, they should embrace and support the promotion of access and utilization of RETs through provision of soft loans to their customers towards acquisition of RETs.
- xi. Development partners should prioritise funding agencies that have a track record and experience with channelling funds to smaller-scale energy projects, such as dedicated special purpose vehicles.
- xii. UECCC should raise awareness of on-lending facilities for renewable energy projects among market participants through developing marketing materials and organising promotion events.
- xiii. Renewable energy providers should provide information on financing instruments (mobile payment, PAYG, solar kiosks) and improved payment platforms (multiple language options, transactions security to consumers).
- xiv. Government and financial institutions should promote the mobilisation of funds through local sources such as energy cooperatives & VSLAs.

*b. Focus on hydroelectricity*

- MEMD should diversify the energy mix as a basis for providing modern energy services by investing in such as solar, geothermal, biogas and biofuels to reduce dependency on wood. This can be done through providing direct funding, fostering public-private partnership or providing credit lines for the private sector. Investment in off-grid systems (such as solar systems) is the best option of providing electricity services to scattered households in rural areas with low energy consumption, as they do not require extension of grid lines, which is not only costly, but has become challenging due to the difficulties in acquisition of way leaves and the rights of way. To achieve this, the ministry needs to set off-grid targets i.e. the percentage of total energy or electricity obtained from off-grid renewables.
- MEMD should promote community participation and ownership. This is vital for off-grid electrification programmes in particular. Financial support of renewable energy projects by communities allows residents/owners to decide what technology to apply (such as solar PV, wind, or biomass) and how resultant energy services are used; they are not passive consumers, but active participants and might even be energy producers.
- MEMD should promote and facilitate the preparation and implementation of a domestic biogas systems and large-scale biogas plants. By use of biogas, vulnerable populations such as women and children will no longer be exposed to indoor air pollution and farmers who own bio-digesters will practice organic farming using bio-slurry as a fertiliser and pesticide.

*c. Fragmented funding landscape and a scattergun approach to projects*

- MoFPED should establish an innovation fund, linked to the renewable energy strategy to provide: access to finance for entrepreneurs and local businesses in the off-grid industry; innovative financial mechanisms, such as convertible grants; and support feasibility studies for new business models, local entrepreneurs and technology implementation;

*d. Policy and regulatory environment*

- MEMD should review the Renewable Energy Policy to clearly spell out the role of NGOs, since they are increasingly playing a great role in improving access of RETs.
- MEMD should mix centralised top-down grid extension with decentralised demand-driven bottom-up strategies (mini-grids and standalone solutions).
- MoFPED should put in place a stable and predictable taxation regime for the renewable energy sector, for instance reviewing the VAT regulations as far as the exemption of developers as well as providing uniform incentives for all RETs including cook stoves.

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<sup>24</sup> <http://isolaralliance.org/>.

- MEMD should develop and implement the off-grid policy to facilitate the mainstreaming of off-grid systems and institutional solutions in the National Energy Policy that clearly articulates the planned contribution of off-grid systems, approach, and amount of investment required to achieve the set targets.
  - UIA needs to continue to press ahead with wide-ranging reforms that create an attractive environment for investing in renewable energy access.
  - REA should track energy sector investment through tracking information from not only government ministries, but also development partners and non-profit organisations.
- e. *Capacity and institutional challenges*
- MEMD should increase funding towards research and development (R&D) of renewable energy technologies to increase Uganda's competitive advantage.
  - MEMD should invest in skills and training for clean off-grid system installation, repairs and maintenance. This can be done through coordinating with the institutions of higher learning such as technical colleges to put in place industrial trainings for students and also enhance research in new technologies.
  - The sector agencies (MEMD, UETCL, UEGCL) need to build capacity in the execution of infrastructure projects through continuous skills development and training in areas of procurement and contract management.
  - Development partners and NGOs should enhance the capacity (technical and business skills) of stakeholders in the energy sector in order to facilitate promotion of off-grid solutions in the country.
- f. *Quality issues and consumer protection*
- MoFPED should provide more funding to UNBS in order to effectively certify, monitor and enforce standards of all RETs.
  - Parliament should expedite the passing of the Consumer protection bill.
  - Private sector actors should implement a certification process and self-regulation for RET companies including distributors and installers, e.g. through Uganda Solar Energy Association (USEA).
  - Private sector and NGOs actors should build an information portal through websites and mobile technology to avail information to end users regarding good quality RET products and services.
- g. *Unsustainable use of biomass*
- i. Uganda has to utilise the biomass resources in a way that is more efficient, more sustainable and introduce modern technology for transformation and end use. Linkages between forestry and agricultural sectors and the energy and environment sectors management must ensure sustainable use and management of biomass. Therefore, MWE through the Forest Sector Support Department and the National Forest Authority should ensure a sustainable forest management system through among others, operationalizing Uganda's National Tree Fund to provide sustainable financing for tree planting.
  - ii. Local charcoal production and supply should be well-managed through use of modern equipment and methods that meet international efficiency standards. Therefore, MWE, MEMD, NFA and LGs should advance and upscale the green charcoal production and related regulation of charcoal production in Uganda.
- h. *Inadequate funding at local government levels*
- i. MoFPED & MEMD should allocate funds Local Governments to support the promotion of renewable energy investments at the lowest levels
  - ii. MEMD should decentralize the coordination of energy services at District Local Government levels to support the promotion of renewable energy investments at the lowest levels.
  - iii. LGs should recognise the energy sub-sector as part of the ENR and thus allocate funds and recruit staff to handle energy issues within the LGs. A certain percentage of the ENR condition grant should be earmarked for RE.
  - iv. LGs should demand that oil and gas royalties are provide and invested in promotion of renewable energy investments.

*i. Inadequate knowledge and poor attitudes towards RETs*

- i. MEMD should develop a communication strategy to foster a common understanding and appreciation of Renewable Energy among the multiple actors.
- ii. MEMD, LGs, Development partners and NGOs should work together to increase massive targeted community awareness campaigns on RETs through dissemination of relevant information on benefits, cost, sales outlets, etc. Both men and women should be targeted for sensitisation and capacity building.

**5.3 Proposed action for Environmental Alert and partners.**

Given that investment and financing renewable and clean energy technologies (especially off-grid) is still insignificant, and, even in the long-term, any increases in financing will largely go towards on-grid electricity. Since the importance of off-grid power systems in terms of providing good opportunities for increasing access to energy to all Ugandans is known, the advocacy strategy could focus on the following areas:

- i. It may be necessary to study and make a presentation of possible ideological flaws in the current approach by government in investing heavily in on-grid large-scale hydroelectricity projects. There is need to advocate for increased Government investments in off-grid power systems for purposes of breaking up the binding constraints towards energy access for all.
- ii. There are several points within the national level budget processes at which key budget allocations decisions are made. These include; the political levels say during consultations within the ruling party (influencing or interpretation of the Manifesto), MoFPED, National Consultative meetings, Sectoral level and Parliament. Understanding of the timing and politics - internal processes within each of these institutions is critical for a successful advocacy. It is worth noting that only certain decisions can be influenced at each stage of the budget process. For example, intra-sectoral allocations may be greatly influenced at the Sector Working Group level. Thus, should engage the energy working group and Parliament (especially the committee on natural resources) to allocate more funds towards more investment in off-grid renewable energy options.
- iii. Environmental Alert and partners should undertake a follow-up study governance in renewable energy sector to understand the power dynamics in a bid to target influential power centers, especially those whose views can't be easily changed or influenced. To prevent any policy challenges, some individuals quite often treat alternative views as sabotage, anti-government, bureaucratic or sluggish. This 'scare crow' method has been found to be highly effective and is widely used across Government.
- iv. Support DLGs to develop and pass ordinances on sustainable use of biomass, especially firewood and charcoal. The development of such ordinances should be done in a bottom-up and participatory processes involving the communities.
- v. There is weak coordination and engagement by CSOs on renewable energy issue. EA and partners should strengthen coordination and engagement among CSOs on renewable energy issues.
- vi. Undertake studies to understand how funds can be mobilized through local sources such as energy cooperatives & VSLAs.

Finally, the only way to ensure increased spending towards renewable and clean energy, constant advocacy is required at central and local government. But given the nature of budgeting in Uganda; emphasis on national level advocacy is likely to yield better results. The advocacy strategies to be developed and implemented should be based on how best each power center can change the structure of the budget.

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## ANNEXES

### Annex 1: List of Respondents

#### *National Level*

SN	Name	Position	Institution
1.	Ms. Allen Tebugulwa	Energy Officer	National Planning Authority (NPA)
2.	Mr. Wilson Wafula	Commissioner, Renewable Energy	MEMD
3.	Mr. Maclian Senyonga	Energy Officer	MEMD
4.	Mr. Benon Bena	Manager Off Grid Renewable Energy	REA
5.	Mr. Fred Wamala	Senior Engineer	UEDCL
6.	Ms. Christine Ambayo Muhumuza	Engineer	UEDCL
7.	Mr. Nathan Kanzungu	Environment and Safety Officer	UEDCL
8.	Mr. Roy Nyamutale Baguma	Director, Transaction Execution	UECCC
9.	Mr. Desmond Tutu Opio	Senior M&E Specialist	UECCC
10.	Ms. Racheal Arinda Baalessanvu	Principal Planning Engineer	UETCL
11.	Mr. Benon Rukundo	Senior Manager Credit	Post Bank
12.	Mr. Lambert Olidio	Principal Economist	MoFPED
13.	Mr. Gideon Gariyo	Economist	MoFPED
14.	Mr. David Livingstone Ebiru	Acting Executive Director	UNBS
15.	Ms. Rebecca Kizito	Principal Standards Officer	UNBS
16.	Mr. Moses Nahamya	Principal Corporate Planner	UNBS
17.	Dr. Alex Rwabizambuga	Chief Country Economist	AfDB
18.	Mr. Francis Odongo Abibi	Bank Economists	UDB
19.	Mr. Paul Mafabi	Director Environment Affairs	MWE
20.	Mr. Peter Kityo	Environment Specialist	ERA
21.	Mr. Innocent Nasswali	Senior Financial Assistant	ERA
22.	Mr. Lindah J Ddumba	Senior Legal Officer	ERA
23.	Mr. Abdul Kyanika Nsibambi	Manager Consumer Lending	Centenary Bank
24.	Mr. Gregor Probst	Technical Advisor Sustainable Energy, Climate & Early Warning Systems	UNDP
25.	Mr. Ibrahim Mutebi	Renewable Energy Manager	WWF
26.	Mr. Gunter Engelits	Counselor Head of Office	Austria Development Cooperation
27.	Ms. Alison Boess	Bright Life	FINCA
28.	Mr. David Damberger	Managing Director and Director of Data Uganda	M-Kopa Solar
29.	Dr. Joshua Zake (PhD)	Executive Director	Environmental Alert (EA)
30.	Ms. Rachel Nalule	Programme Officer	EA
31.	Mr. James Thembo	Programme Assistant	EA
32.	Mr. Wamagale Herbert	Programme Manager	EA

*Local Government Level*

1.	Mr. Ashaphan Andeku	District Planner	Arua DLG
2.	Mr. Joachim Andiandu	District Environmental Officer	Arua DLG
3.	Mr. Edson Gestive Adiribo	District Forest Officer	Arua DLG
4.	Mr. Kooli Augustine	Senior Environment Officer	Kasese DLG
5.	Mr. Bwambale W W	Senior Forest Officer	Kasese DLG
6.	Mr. Joseph Katswera	District Natural Resource Officer	Kasese DLG
7.	Mr. Mugenzi Sam	District Natural Resource Officer	Kagadi DLG
8.	Mr. Ngonawe P W	District Community Development Officer	Kagadi DLG
9.	Mr. Asiimwe Vicent	Senior Administrative Secretary	Kagadi DLG
10.	Ms. Natukunda Mary	Gender Officer	Kagadi DLG
	Mr. Isingoma Raphael	District Planner	Kagadi DLG
11.	Ms. Asiimwe Oliver	Secretary Production	Kagadi DLG
12.	Mr. Balikuddembe S M Louis	District Natural Resource Officer	Kibaale DLG
1.	Mr. Nickolas Alibua	Accountant	Koboko United SACCO
2.	Mr. Emmanuel Vicky Onyai	Director	APEF, Nebbi
3.	Mr. Abubaker Ezale	Manager	MADIFA
4.	Mr. Isaac Wayi	Executive Director	CERID, Koboko
5.	Ms. Mary Tasia	Extension Staff	MUFA, Moyo
6.	Mr. Vaentine Adunga	Executive Director	CREAM
7.	Ms. Mary Dawani	Focal Point Person	Nile Pro Trust Ltd
8.	Mr. Moses Okwanga	Executive Director	AYFAP
9.	Mr. David Wayi	APC	PICTO, Koboko
10.	Mr. Sunday Asau	Executive Director	CEMU
11.	Ms. Binega V Prosen	Chairperson	PACEGO WC, Pakwach
12.	Mr. Harry Andama	Manager	Solar Now, Arua
13.	Mr. Alex Matua	MD	Nile Micro Finance, Arua
14.	Mr. Joseph Akuti	Extension Officer	DFA, Moyo
15.	Mr. Richard Kajura	Project Coordinator	LACWADO, Buliisa
16.	Mr. Mwesige Moses	Head of Programmes	Kyenjojo NGO&CBO Forum, Kyenjojo
17.	Mr. Robert Mukisa	Energy Project-Trainee	KCSON, Kagadi
18.	Mr. Jackson Mutegeki	Energy Coordinator	KCSON, Kagadi
19.	Mr. Kyotasobora Phinehas	Executive Director	Bunyoro Choice Uganda, Masindi
20.	Mr. Mugisa Byakagaba	Executive Director	KASFA, Hoima
21.	Mr. Musinguzi Fred	Coordinator	KDFA, Kagadi
22.	Mr. Mateso Diadone	Coordinator	Kyaterekera Women Group, Kagadi
23.	Mr. Kusemererwa Ismail	Project Officer	MIRAC, Hoima
24.	Mr. Aye bale Didan	Coordinator	ISACE, Kagadi
25.	Mr. Nuwajuwa Lawrence	Manager	FENIX, Kagadi
26.	Mr/ Azor Kwegu	Credit Manager	Centenary Bank, Kagadi
27.	Mr. John Baptist Byaruhanga	Branch Manager	Solar Now, Kagadi
28.	Mr. Muhiindo Mike Zimonia	Manager-Kasese	M-Kopa Solar
29.	Mr. Ndungo Apolo Muleju	Manager-Kasese	Kasese Peoples SACCO
30.	Ms. Muhindo Jonan Kom	CEO	CODEA
31.	Mr. Engwe B Moses	Chairperson	KIKA
32.	Mr. Magezi Eliezer	Manager	BBC
33.	Ms. Barugahare Fatuma	Vice Chairperson	Kataara Women's Poverty Alleviation

34.	Mr. Namanya Imam	Project Focal Person	COVID
35.	Mr. Baluku Williams	Sales Person	MTN Ready pay
36.	Mr. Masereka Samuel	Project Officer	Good Hope
37.	Mr. Amson M Ronald	Project Officer	UNCIDA
38.	Mr. Bitswanirya Enock	Coordinator	REDMO
39.	Mr. Tumwesigye Samuel	Beneficiary	SEA
40.	Mr. Nsegijumva Deogratias	Director	SEA
41.	Mr. Johnson Maseruka	Director	ASD
42.	Mr. Mbahimba Jimmy	Coordinator	KAWODA
43.	Mr. Mutsungu Celestine	Director	MUFLI
44.	Mr. Kibingo William	Project Officer	Karambi SACCO

## Annex 2: Small Hydropower Committed and Candidate Generation

No	Project Name	Installed Capacity (MW)	Estimated Commission Date	No	Project Name	Installed Capacity (MW)	Estimated Commission Date
1.	Bukinda	6.5	2018	2.	Mahoma	3	2018
3.	Bukwa	9	2019	4.	Muvumbe	6.5	2017
5.	Kabeywa	12	2019	6.	Muyembe-Sirimityo	6.9	2019
7.	Kakaka	5	2018	8.	Ndugutu	5.1	2018
9.	Keere	6.3	2020	10.	Nengo Bridge	6.7	2019
11.	Kikagati	16	2018	12.	Ngoromwo	8	2020
13.	Kyambura	8.3	2018	14.	Nkusi	9	2019
15.	Lubilia	5.4	2018	16.	Nyabuhuka-Mujunju	3.2	2019
17.	Nyagak III	4.36	2018	18.	Rwimi	5.54	2017
19.	Nyamagasani	15	2021	20.	Sindila	5.25	2018
21.	Nyamagasani 2	8	2018	22.	Sironko	7	2019
23.	Nyamwamba	9.2	2017	24.	Siti 1	5	2018
25.	Siti 2	16.5	2018	26.	Waki	4.8	2018

Source: ERA (2016)

	Agency	Amounts	Remarks
1.	MEMD	UGX 1,826.50 Billion (2017/18)	Allocation to Energy Planning, Management & Infrastructure Development and Large Hydro Power Infrastructure.
2.	Uganda Energy Credit Capitalisation Company (UECCC)	US \$ 3.0 Million	<i>Solar Loan Product:</i> Extended Participating Financial Institutions (PFIs) [Pride Microfinance, Centenary Bank, Finance Trust Bank, and Postbank Uganda) for on-lending to households and commercial enterprises for solar systems acquisition.
		UGX 1 billion	<i>Solar Financing framework for Tier 4 financial institutions.</i> Extended to SACCOs and MFIs for on-lending to their members to acquire solar systems. Currently working with Tujjenge Uganda Ltd, Hofokam Ltd & EBO SACCO Ltd to solar loans to households and commercial enterprises.
		US \$ 8.5 Million	<i>Solar Working Capital Facility:</i> provide working capital to PFIs for on-lending to solar companies, especially those selling solar systems on a pay plan or pay as you go model. Implemented by PFIs (Centenary Bank, Barclays Bank Uganda, Stanbic Bank Uganda, Finance Trust Bank, and Postbank Uganda). Each company can borrow up to USD 1.5 million at an interest not more than 15% per annum.
		UGX 1 billion	<i>Connection Loan Programme:</i> Enables households and commercial enterprises to access electricity by connecting to the grid. Piloted with Centenary Bank and WENRECO. Currently the facility is available at all Centenary Bank branches.
		UGX 210 million	<i>The Biomass Refinance Facility:</i> partnered with EBO SACCO Ltd to pilot a Biomass Financing Facility for on lending to households and commercial enterprises for the acquisition of Biogas systems.
		Euro 1.5 million	Technical Assistance. Provides TA to PFIs and Independent Power Producers (IPPs) to address various capacity gaps in pre-investment studies and research.
3.	Development Banks		<ul style="list-style-type: none"> <li>AfDB - Energy portfolio accounts about 14% of the entire portfolio (USD 1.1 billion).</li> </ul>

4.	Development Partners		<ul style="list-style-type: none"> <li>▪ USAID - Power Africa is supporting master planning efforts for 13 distribution company concessions, identifying opportunities for new connections. Power Africa in Uganda is working with financial institutions and concessionaires to mobilise finance, enabling financing across the value chain.</li> <li>▪ DFID - Energy Africa: to catalyse private sector markets in solar home systems (SHS), to help bring universal energy access in a very cost effective manner, and allowing people to take control of their energy needs.</li> <li>▪ European Union - EU-ACP Energy Facility (EUR 10.6M) EU-ACP Energy Facility, the EU finances three projects: i) Access to energy services in rural and peri-urban areas in northern Uganda (EUR 4 million); ii) Scaling-up rural electrification using innovative solar photovoltaic (PV) distribution models (EUR 4.3M); and Scaling-up access to modern electricity services on a regional scale in rural Sub-Saharan Africa by means of a fee for service business model (EUR 2.3 million). Also supports the SE4ALL initiative in Uganda in providing Technical Assistance.</li> <li>▪ Norwegian Government/NORAD- Supports WWF programmes in Kasese through the champion district initiative and commercialisation of solar powered cook stoves at the Department of Physics/Makerere University.</li> <li>▪ SIDA Uganda programme (2016-2020) USD 4.6 million. Renewable Energy Challenge fund - to support qualifying SMEs (for off-grid solutions including solar) with scalable market-led business models through a competitive process to access grants.</li> <li>▪ Austria Development Cooperation. ADC is playing a central role in the establishment of the East African Center for Renewable Energy &amp; Energy Efficiency (EACREEE) which is hosted by Makerere University at CEDAT.</li> <li>▪ WWF- UCO Provides USD 2 -3 million on renewable energy through grant financing.</li> <li>▪ UDB</li> <li>▪ EADB</li> <li>▪ KFW</li> <li>▪ IDA</li> <li>▪ China Exim (Karuma and Isimba Dams)</li> <li>▪ JICA</li> <li>▪ BADEA/ SFD</li> <li>▪ OFID</li> <li>▪ IDB</li> </ul>
5.	United Nations Development Fund (UNCDF)	<i>Clean Start programme (2012 – 2018)- \$1.8M (grant funding) and \$3 M (leverage)</i>	<p><i>Clean Start programme (2012 – 2018):</i> CleanStart has four components: Finance for clean energy to develop scalable consumer and enterprise financing models; Technical assistance for clean energy to increase the ‘scale’ potential of financing models by creating a supportive business ecosystem; Knowledge and Learning to promote awareness and customer-centric growth; and Advocacy and Partnerships to co-create a policy and business environment that supports energy microfinance to reach scale.</p> <p>During the 1<sup>st</sup> phase (August 2015), the challenge fund supported:</p> <ul style="list-style-type: none"> <li>– FINCA - Loans initially for solar lanterns</li> <li>– ECO-Group - production and distribution of clean cook stoves and provide affordable solar home systems.</li> </ul>

			<ul style="list-style-type: none"> <li>- D Light -distribute solar home systems with a flexible payment arrangement through pay go.</li> <li>- BioLite –provision of affordable clean cook stoves</li> <li>- Village Power</li> </ul> <p>During the 2<sup>nd</sup> phase, challenge fund (ranging from USD 50,000 to 150,000) supported:</p> <ul style="list-style-type: none"> <li>- Fenix International - cook stoves and PV Solar systems on credit</li> <li>- Green Heat international - Manufacture of briquettes</li> <li>- Josa Green Tech - improved industrial cook stoves to schools</li> <li>- Warner Energy - provide LPG gas to households in a pay as you go basis</li> <li>- Simoshi Limited</li> <li>- Raising Gabdho Foundation (RGF )</li> </ul> <p>Under the 3rd Phase, 16 companies applied and the selected companies will receive USD 100,000 to 500,000, mainly focusing on Solar technologies.</p>
6.	Global Energy Transfer Feed in Tariff (GETFiT) Programme	GETFiT programme - EUR 93.6 million (committed)	The GETFiT program is implemented by Electricity Regulatory Agency (ERA) with support from KfW, DFID, EU, Norwegian government. The programme is designed to leverage private investment into renewable energy generation projects in Uganda. The programme is fast-tracking a portfolio currently of 17 small-scale renewable energy (RE) generation projects, promoted by private developers and with a total installed capacity of 157 MW.
7.	World Bank (ERT)	World Bank - US\$ 256.9 million <sup>25</sup> (committed)	<p>The projects include:</p> <ul style="list-style-type: none"> <li>▪ Uganda Rural Electrification - US\$ 13.7 million</li> <li>▪ Uganda Grid Expansion and Reinforcement Project (GERP) - US\$ 100 million</li> <li>▪ Uganda Energy for Rural Transformation III - US\$ 135.0 million</li> <li>▪ UG GEF Energy for Rural Transformation III - US\$ 8.2 million</li> </ul> <p>GPOBA: Uganda Energy for Rural Transformation - US\$ 0.03 million</p>
8.	Financial Institutions and Private Sector		<ul style="list-style-type: none"> <li>▪ Post Bank - provide credit to the public and private sector to acquire renewable energy equipment.</li> <li>▪ Centenary Bank; loaned over UGX 1.5 billion</li> <li>▪ PRIDE Micro-finance</li> <li>▪ Finance Trust Bank</li> <li>▪ FINCA - Bright Life Finca; invested over 0.5 million and raised 0.5 million from donors.</li> <li>▪ Barclays Bank Uganda</li> <li>▪ Stanbic Bank Uganda</li> <li>▪ Finance Trust Bank</li> <li>▪ M-Kopa - Invested over USD 30 million. Financing acquisition of solar systems especially the SHS using the Pay As You Go Solar method.</li> </ul>

**Annex 3: Potential Domestic renewable energy funding.**

	Agency	Amounts	Remarks
	MEMD	UGX 1,826.50 Billion (2017/18)	Allocation to Energy Planning, Management & Infrastructure Development and Large Hydro Power Infrastructure.
	Uganda Energy Credit Capitalisation Company (UECCC)	US \$ 3.0 Million	<i>Solar Loan Product:</i> Extended Participating Financial Institutions (PFIs) [Pride Microfinance, Centenary Bank, Finance Trust Bank, and Postbank Uganda) for on-lending to households and commercial enterprises for solar systems acquisition.
		UGX 1 billion	<i>Solar Financing framework for Tier 4 financial institutions.</i> Extended to SACCOs and MFIs for on-lending to their members to acquire solar systems. Currently working with Tujjenge Uganda Ltd, Hofokam Ltd & EBO SACCO Ltd to solar loans to households and commercial enterprises.
		US \$ 8.5 Million	<i>Solar Working Capital Facility:</i> provide working capital to PFIs for on-lending to solar companies, especially those selling solar systems on a pay plan or pay as you go model. Implemented by PFIs (Centenary Bank, Barclays Bank Uganda, Stanbic Bank Uganda, Finance Trust Bank, and Postbank Uganda). Each company can borrow up to USD 1.5 million at an interest not more than 15% per annum.
		UGX 1 billion	<i>Connection Loan Programme:</i> Enables households and commercial enterprises to access electricity by connecting to the grid. Piloted with Centenary Bank and WENRECO. Currently the facility is available at all Centenary Bank branches.
		UGX 210 million	<i>The Biomass Refinance Facility:</i> partnered with EBO SACCO Ltd to pilot a Biomass Financing Facility for on lending to households and commercial enterprises for the acquisition of Biogas systems.
		Euro 1.5 million	Technical Assistance. Provides TA to PFIs and Independent Power Producers (IPPs) to address various capacity gaps in pre-investment studies and research.
	Development Banks		<ul style="list-style-type: none"> <li>▪ AfDB - Energy portfolio accounts about 14% of the entire portfolio (USD 1.1 billion).</li> <li>▪ USAID - Power Africa is supporting master planning efforts for 13 distribution company concessions, identifying opportunities for new connections. Power Africa in Uganda is working with financial institutions and concessionaires to mobilise finance, enabling financing across the value chain.</li> <li>▪ DFID - Energy Africa: to catalyse private sector markets in solar home systems (SHS), to help bring universal energy access in a very cost effective manner, and allowing people to take control of their energy needs.</li> <li>▪ European Union - EU-ACP Energy Facility (EUR 10.6M) EU-ACP Energy Facility, the EU finances three projects: i) Access to energy services in rural and peri-urban areas in northern Uganda (EUR 4 million); ii) Scaling-up rural electrification using innovative solar photovoltaic (PV) distribution models (EUR 4.3M); and Scaling-up access to modern electricity services on a regional scale in rural Sub-Saharan Africa by means of a fee for service business model (EUR 2.3 million). Also supports the SE4ALL initiative in Uganda in providing Technical Assistance.</li> </ul>

12.	Development Partners		<ul style="list-style-type: none"> <li>▪ Norwegian Government/NORAD- Supports WWF programmes in Kasese through the champion district initiative and commercialisation of solar powered cook stoves at the Department of Physics/Makerere University.</li> <li>▪ SIDA Uganda programme (2016-2020) USD 4.6 million. Renewable Energy Challenge fund - to support qualifying SMEs (for off-grid solutions including solar) with scalable market-led business models through a competitive process to access grants.</li> <li>▪ Austria Development Cooperation. ADC is playing a central role in the establishment of the East African Center for Renewable Energy &amp; Energy Efficiency (EACREEE) which is hosted by Makerere University at CEDAT.</li> <li>▪ WWF- UCO Provides USD 2 -3 million on renewable energy through grant financing.</li> <li>▪ UDB</li> <li>▪ EADB</li> <li>▪ KFW</li> <li>▪ IDA</li> <li>▪ China Exim (Karuma and Isimba Dams)</li> <li>▪ JICA</li> <li>▪ BADEA/ SFD</li> <li>▪ OFID</li> <li>▪ IDB</li> </ul>
13.	United Nations Development Fund (UNCDF)	<p><i>Clean Start programme (2012 – 2018)- \$1.8M (grant funding) and \$3 M (leverage)</i></p>	<p><i>Clean Start program (2012 – 2018):</i> CleanStart has four components: Finance for clean energy to develop scalable consumer and enterprise financing models; Technical assistance for clean energy to increase the ‘scale’ potential of financing models by creating a supportive business ecosystem; Knowledge and Learning to promote awareness and customer-centric growth; and Advocacy and Partnerships to co-create a policy and business environment that supports energy microfinance to reach scale.</p> <p>During the 1<sup>st</sup> phase (August 2015), the challenge fund supported:</p> <ul style="list-style-type: none"> <li>– FINCA - Loans initially for solar lanterns</li> <li>– ECO-Group - production and distribution of clean cook stoves and provide affordable solar home systems.</li> <li>– D Light -distribute solar home systems with a flexible payment arrangement through pay go.</li> <li>– BioLite –provision of affordable clean cook stoves</li> <li>– Village Power</li> </ul> <p>During the 2<sup>nd</sup> phase, challenge fund (ranging from USD 50,000 to 150,000) supported:</p> <ul style="list-style-type: none"> <li>– Fenix International - cook stoves and PV Solar systems on credit</li> <li>– Green Heat international - Manufacture of briquettes</li> <li>– Josa Green Tech - improved industrial cook stoves to schools</li> <li>– Warner Energy - provide LPG gas to households in a pay as you go basis</li> <li>– Simoshi Limited</li> <li>– Raising Gabdho Foundation (RGF )</li> </ul>

			Under the 3rd Phase, 16 companies applied and the selected companies will receive USD 100,000 to 500,000, mainly focusing on Solar technologies.
14.	Global Energy Transfer Feed in Tariff (GETFiT) Programme	GETFiT programme - EUR 93.6 million (committed)	The GETFiT program is implemented by Electricity Regulatory Agency (ERA) with support from KfW, DFID, EU, Norwegian government. The programme is designed to leverage private investment into renewable energy generation projects in Uganda. The programme is fast-tracking a portfolio currently of 17 small-scale renewable energy (RE) generation projects, promoted by private developers and with a total installed capacity of 157 MW.
15.	World Bank (ERT)	World Bank - US\$ 256.9 million <sup>26</sup> (committed)	The projects include: <ul style="list-style-type: none"> <li>Uganda Rural Electrification - US\$ 13.7 million</li> <li>Uganda Grid Expansion and Reinforcement Project (GERP) - US\$ 100 million</li> <li>Uganda Energy for Rural Transformation III - US\$ 135.0 million</li> <li>UG GEF Energy for Rural Transformation III - US\$ 8.2 million</li> <li>GPOBA: Uganda Energy for Rural Transformation - US\$ 0.03 million</li> </ul>
16.	Financial Institutions and Private Sector		<ul style="list-style-type: none"> <li>Post Bank - provide credit to the public and private sector to acquire renewable energy equipment.</li> <li>Centenary Bank; loaned over UGX 1.5 billion</li> <li>PRIDE Micro-finance</li> <li>Finance Trust Bank</li> <li>FINCA - Bright Life Finca; invested over 0.5 million and raised 0.5 million from donors.</li> <li>Barclays Bank Uganda</li> <li>Stanbic Bank Uganda</li> <li>Finance Trust Bank</li> <li>M-Kopa - Invested over USD 30 million. Financing acquisition of solar systems especially the SHS using the Pay As You Go Solar method.</li> </ul>

**Source:** Author's calculations based on Document review and key informant interview

#### Annex 4: Potential International renewable energy funding

	Agency	Amounts	Period	Remarks
1.	Acumen	USD 7M – 10M	3 Years	Support enterprises serving off-grid markets in multiple Power Africa countries.
2.	DFID (private sector investment and innovation in low cost, clean energy technologies)	£49 M		Renewable Energy and Adaptation to Climate Technologies (REACT) window of the Africa Enterprise Challenge Fund)
		£27.5 M		Energy and Environment Partnership Programme (EEP)
		£40 M		Results Based Financing for Low Carbon Access (RBF)
	DFID (Energy Africa campaign)	£65 M		Transforming Energy Access (TEA)- is a research programme supporting early stage testing of innovative technology applications, business models and financing, and also the skills development that could dramatically accelerate their provision.
		£65 M		Africa Clean Energy (ACE) Business- help catalyse the SHS market across Energy Africa countries
		USD 36 M		The Scaling Off-Grid Energy Grand Challenge is partnership among DFID, USAID (on behalf of Power Africa) and Shell Foundation to create 20m connections across Sub-Saharan Africa.

<sup>26</sup> Accessed from [http://projects.worldbank.org/search?lang=en&searchTerm=&countrycode\\_exact=UG](http://projects.worldbank.org/search?lang=en&searchTerm=&countrycode_exact=UG).

3.	UNCDF's	US\$26 million		Clean Start: 6 countries in Asia and Africa; by providing risk capital grants and/or concessional refinancing. In Uganda, CleanStart launched three new challenge rounds to support innovations in 1) clean cooking, 2) pico solar power, and 3) large solar power ; and complete two customer research pieces
4.	Bamboo Finance	US\$ 20 million	5 years	
5.	BBOXX			BBOXX is a venture backed company developing solutions to provide affordable, clean energy to off-grid communities
6.	Capricorn Investment Group			Invest in companies providing solar power, hybrid power systems.
7.	Cross Boundary	US\$200 million	5 years	Provision of an aggregated investment platform to finance installation of off-grid renewable generation assets for commercial customers to offer commercial consumers conversion from diesel to more efficient renewable technologies
8.	The Tony Elumelu Foundation		5 years	Enhance access to clean and efficient energy by exploring an off grid installation
9.	Embark Energy	\$4.5 million		To advance the Beyond the Grid goal of providing access to clean, reliable energy, Embark Energy
10.	Energiya	\$750 million	5 years	Increase access to electricity to millions of households that do not have access to the national grid
11.	Fenix International	\$287 million		Intent to advance the Beyond the Grid goal of providing access to clean, reliable energy.
12.	Global Off-Grid Lighting Association			Position off-grid lighting outside the philanthropic arena as a fully recognised industry in an important and growing market.
13.	Gray Ghost Ventures	USD \$50 million	5-6 years	Aims to provide access to (its advanced solar power technology) to small entrepreneurs in rural areas
14.	Invested Development	\$20 million		Extend electrification beyond the grid in Sub-Saharan Africa to include additional equity and debt capital representing a significant part of our \$20 million in committed capital
15.	LGT Venture Philanthropy			Advance the Beyond the Grid goal of providing access to clean, reliable energy.
16.	Liberia Energy Network			Distribute over 200,000 "plug and play" solar LED lighting and cell phone charging units, approved by the World Bank Lighting Africa Programme throughout Liberia, providing light to over 1 million Liberians
17.	Mosaic	US\$125M	5 years	Investment for small-scale energy service providers and energy projects in Power Africa countries over which will increase access to electricity to 10 million users in these countries
18.	Schneider Electric	USD 60-80 million	5 years	Provide venture capital to off-grid energy SMEs, in Sub-Saharan Africa, over the next five years, with The Energy Access Fund (EAF).
19.	Shell Foundation			Support the expansion of mini-grids in Africa; catalyse the provision of appropriate debt finance to energy enterprises operating in Africa
20.	Solar Sister		5 years.	Intent to advance the Beyond the Grid goal of providing access to clean, reliable energy
21.	Sunfunder	US\$ 120 million	5 years	Increase access to electricity to more than 4 million individuals in these countries.
22.	UN Foundation			UN Foundation intends to continue its support of Sustainable Energy for All and the Energy Access Practitioner Network.
23.	Virunga Power			To advance the Beyond the Grid goal of providing access to clean, reliable energy

**Source:** Author's calculations based on Document review.

## Annex 5: Data Collections tools.

### A. Government MDAs

1. To what extent does the current policy, legal and institutional framework support increased financing/ investment for clean and renewable energy access (off- grid and on-grid) development?
  - Opportunities and challenges with the frameworks
2. To what extent are the current energy policy reforms improving access to clean and renewable energy especially in rural areas?
3. What is the level of public investment in financing/ investment for clean and renewable energy access? – *amounts over the last three years*
4. What is the potential of public investment towards providing energy access to Ugandans, especially those in rural areas?
5. What are the current financing needs for scaling-up clean and renewable energy access in Uganda? – *probe both supply and demand side*
6. To what extent does government provide incentives to facilitate private sector investment in delivery of clean and renewable energy solutions?
7. What is the level of FDI in clean and renewable energy access? – *amounts over the last three years*
8. What opportunities exist for investment in clean and renewable energy in Uganda?
9. How can key players in the energy sector utilise these opportunities?
10. Do you have any partnerships with NGOs, Donors, & Private sector for delivery of clean and renewable energy solutions?
  - If, Yes explain.
  - If No, why no partnerships?
11. What are constraints of increasing access to clean and renewable energy, especially in rural areas? – *probe both supply and demand side*
  - What can be done to address these challenges?

### B. Local Governments

1. What has your district done to facilitate access to clean and renewable energy?
2. What strategies have you developed on access to clean and renewable energy?
3. How are you addressing threats related to charcoal production and felling of trees for firewood to meet the bio-energy demand?
4. Have you enacted any ordinances/ bye-laws to improve energy access, efficiency and conservation of forests?
  - If Yes, explain.
  - If No, why?
5. To what extent has district planning processes incorporated issues of energy access, efficiency and conservation of forests?
6. To what extent has your district budgeted for increasing access clean and renewable energy solutions (i.e. improved cook stoves and solar technologies)?
  - If Yes, *amounts over the last three years* & in what areas?
  - If No, why no investment?
7. How has this spending led to improved access to clean and renewable energy in your district?
8. Are you aware of any private sector actors (financial institutions and technology suppliers) investing and/ or providing end-user financing for delivery of clean and renewable energy solutions (improved cook stoves and solar technologies) to rural communities?
  - Yes, give examples.
9. Do you have any partnerships with NGOs, Donors, & Private sector for delivery of clean and renewable energy solutions?
  - If, Yes explain.
  - If No, why no partnerships?
10. What opportunities exist for investment in clean and renewable energy in your district?
11. How can key players in the energy sector utilise these opportunities?
12. What are constraints of increasing access to clean and renewable energy especially in rural areas? – *probe both supply and demand side*
13. What can be done to address these challenges?

### C. Private Sector

1. How is your company involved in increasing access to clean and renewable energy in Uganda?
  - *Activities involved in*
2. What kind of renewable energy technologies are you involved in?
  - *Of these, which is more utilised by consumers?*
3. To what extent does the current policy, legal and institutional framework support your company's efforts towards increasing access to clean and renewable energy in Uganda?
  - *Opportunities and challenges with the frameworks*
4. What is your company's level of investment in increasing access to clean and renewable energy? – *amounts over the last three years*
5. What level of financing does your company need for scaling-up clean and renewable energy access? – *amounts needed*
6. What incentives (mainly from gov't) exist to facilitate your company's investment in delivery of clean and renewable energy solutions?
7. Are you aware of any financing mechanisms that exist for delivery of clean and renewable energy solutions?
  - If yes, mention them.
  - How have you benefited from such financing?
8. What opportunities exist for investment in clean and renewable energy in Uganda?
  - How can key players in the energy sector utilise these opportunities?
9. Are you aware of any private sector actors (financial institutions and technology suppliers) investing and/ or providing end-user financing for delivery of clean and renewable energy solutions (improved cook stoves and solar technologies) to rural communities in Albertine region?
  - Yes, give examples.
10. Do you have any partnerships with Gov't, NGOs, & Donors for investment in clean and renewable energy solutions in Uganda?
  - If, Yes explain.
  - If No, why no partnerships?
11. What efforts / mechanisms have you put in place to ensure that the renewable energy technologies (improved cook stoves and solar technologies) meet the required standards?
12. What are some of challenges faced by your company towards increasing access to clean and renewable energy in Uganda?
  - What can be done to overcome these challenges?
13. What are the constraints of increasing access to clean and renewable energy, especially in rural areas? – *probe both supply and demand side*
  - What can be done to address these challenges?

### D. NGOs

1. How is your organisation involved in increasing access to clean and renewable energy in Uganda?
  - *Activities involved in*
2. What kind of renewable energy technologies are you involved in? – *list them*
  - Of these, which is more utilised by consumers?
3. To what extent does the current environment (policy and legal) support your effort towards increasing access to clean and renewable energy in rural areas?
  - *Opportunities and challenges with the current environment*
4. What is your organisation's level of investment (if any?) in increasing access to clean and renewable energy? – *amounts over the last three years*
  - In case of funding gap - *how much (amount)?*
5. Are there incentives (mainly from gov't) to facilitate your organisation's investment in delivery of clean and renewable energy solutions?
  - If yes, how have utilised them?
6. Are you aware of any financing mechanisms that exist for delivery of clean and renewable energy solutions?
  - If yes, mention them.
  - How have you benefited from such financing?
7. What opportunities exist for investment in clean and renewable energy in Uganda?
  - How can key players in the energy sector utilise these opportunities?

8. Do you have any partnerships with Gov't, Donors, & Private sector for investment in clean and renewable energy solutions in Uganda?
  - If, Yes explain.
  - If No, why no partnerships?
9. What are some of challenges faced by your organisation towards increasing access to clean and renewable energy in Uganda?
  - What can be done to overcome these challenges?
10. What are constraints of increasing access to clean and renewable energy, especially in rural areas? – *probe both supply and demand side*
  - What can be done to address these challenges?

#### **E. UNBS**

1. What is the role of UNBS in the energy sector (especially the renewable energy)?
2. Uganda is currently facing a challenge of low quality products and counterfeits of renewable energy technologies (solar, cook stoves, meters etc.):
  - a. What initiatives have you put in place to address this challenges?
    - How effective have they been?
  - b. How have you contributed to development of standards for renewable energy technologies?
3. How are you working with other stakeholders in the energy sector, to ensure standards for renewable energy technologies?
  - a. Key actions / activities being done?
4. Have you received any support (from either gov't, donors, NGOs) towards development and enforcement of standards for renewable energy technologies (solar, cook stoves, etc.)
  - a. If yes, how much, and what purpose?
  - b. If no, why?
5. Do you think, key actors (sellers and buyers) in Uganda are embracing for standards for renewable energy technologies?
  - a. If Yes, explain how?
  - b. If No, why?
6. There are public complaints about the YAKA meters.
  - a. Have you received any complaints, if so, how have you addressed them?
  - b. Are all YAKA meters, certified by UNBS?
    - If no, why?
7. What are the major challenges of ensuring standards for renewable energy technologies (solar, cook stoves, etc.) in Uganda?
  - a. UNBS challenges (i.e. financing, human resources, technology etc.).
  - b. Key actors (sellers and buyers) challenges.
8. What recommendations would you have towards ensuring standards for renewable energy technologies (solar, cook stoves, etc.) in Uganda?

## Annex 6: Participants list

S/N	Name	Gender	Position/Title	ORGANIZATION/ DISTRICT
1	Dr. Joshua Zake (PhD)	Male	Executive Director	ENVIRONMENTAL ALERT
2	Daniel Lukwago	Male	Director	NONNER CONSULTS
3	Priscilla Nabuyemba	Female	Project Officer	ECOTRUST
4	Wafula Wilson	Male	Agc/Red	MEMD
5	Paul Mulindwa	Male	E.D	KCSON KAGADI
6	Desmond Tutu Opio	Male	SNRM&E Specialist	UECCC
7	Kwebiha Edward	Male	Cordinator	MICOD
8	Gregor Probsk	Male	Technical Advisor	UNDP
9	Gunter Engelits	Male	Head Of Office Adc	AUSTRIAN DEVELOPMENT COOPERATION
10	John Okiira	Male	Research Office	ACODE
11	Lawrence Kawalya	Male	Advocacy	PELUM KAMPALA
12	Jaliah Namubiru	Female	Prog Assistant	EMLI
13	Flavia Ajambo	Female	P.R	CREEC
14	Jonathan K Mayanja	Male	P Manager	TREE TALK PLUS
15	Adiribo Edison	Male	Dnro	ARUA DLG
16	David Kayhui	Male	Sso	UNBS
17	Harriet Ndagire Sempebwa	Female	Partnerships Networking & Training Specialist	KULIKA UGANDA
18	Mugarula Robert	Male	Consultant	NONNER GRP
19	Patrick Oryem	Male	P.O	ACEMP
20	Thumungu Mary	Female	Program Coordinator	AYFAP
21	Bitswanirya Enock	Male	Coordinator	REDMO BUNDIBUGYO
22	Nalule Rachael	Female	P.O	E.A
23	Joseph Mukasa K	Male	Researcher	NONNER CONSULTS
24	Kalishya Steven	Male	Information Officer	WATER & ENVIRONMENT MEDA
25	Muhindo Edith	Female	Coordinator	KIIMA – HUB
26	Muwanguzi Jb Abraham	Male	Sp-T&I	NPA
27	Kasumba Deborah	Male	Admin	BEETA
28	Emmanuel Vicky Onyai	Male	Coordinator	APEF – NEBBI
29	Yunus Alokore	Male	Project Expert	GIZ-PREEEP
30	Concepta Mukasa	Female	Project Officer	AUPWAE
31	Ephrance Nakiyingi	Female	D.M	ACCU KAMPALA
32	Agatha Nalumansi	Male	Admin	UNBA
33	Pax Sakari	Male	P.D	RICEWRO ARUA
34	Dylis Ndibaisa	Female	Research & Conservation Officer	AROCHA UGANDA
35	Businge C. Nicholas	Male	Program Officer	PARLIAMENTARY FORUM ON CLIMATE CHANGE
36	Eng. Kato C	Male	Chairperson	UNBA
37	Daniel Justus Kisakye	Male	Dnro Masindi	MASINDI DLG
38	Abdirahman Zeila	Male	Sir Energy Expert	UNHCR KAMPALA
39	Asinge Noah	Male	Info & Partnerships Officer	UNREEEA
40	Brian Katabazi	Male	E.D	CENTER FOR ENERGY
41	Mumbere Samson	Male	Coordinator	ASD C/O KIIMA
42	Owori Patrick	Male	P Officer	LIVING EARTH UGANDA
43	Oundo Stephen	Male	P.O Knowledge Management	ENVIRONMENTAL ALERT
44	James Thembo	Male	P.A Energy	E/A/EF

**Box 7. About Environmental Alert**

Environmental Alert (EA) was founded in **1988 and this year (2018) marks 30 years** of contribution to improved livelihoods and development in Uganda through several interventions in sustainable agriculture, environment and natural resources management. EA is officially registered with the NGO Board as a Ugandan non-governmental organization, incorporated as a company limited by guarantee. EA is governed by an independent Board that is responsible for providing strategic oversight of the organization including ensuring its integrity as a voluntary service organization.

EA is a **1<sup>st</sup> prize winner of the Energy globe award for environmental sustainability-2005 under the category, earth.**

EA is a member of the International Union for Conservation of Nature (IUCN) and a Member of The IUCN National Committee for Uganda.

EA envisions, *'Resilient and dignified communities, managing their environment and natural resources sustainably.'*

**EA's mission is to,** *'Contribute to improved livelihoods of vulnerable communities by enhancing agricultural productivity and sustainable natural resources management'*

**Program and institutional Components:**

1. Environment and Natural resources management;
2. Food security and Nutrition;
3. Water, Sanitation and Hygiene;
4. Finance and Administration;
5. Resource mobilization and Investment.

**Scale of Implementation:**

EA operates in selected districts for generation of evidence to inform policy engagements on agriculture, environment and natural resources at National and International levels. Currently EA's operations are in 20 districts across the country. EA undertakes area wide targeted awareness on selected issues in agriculture, environment and natural resources engagements

**EA is a Secretariat for following networks:**

- a) The Network for Civil Society Organizations in Environment & Natural Resources Sector (ENR-CSO Network) - <http://enr-cso.org/>;
- b) Uganda Forestry Working Group - <http://ufwg.entalert.org/>;
- c) The Standards Development Group (for promotion of Sustainable Forest Management in Uganda); and
- d) Promoting Local Innovation in ecologically oriented agriculture and natural resources management (PROLINNOVA-Uganda Network) - <http://www.prolinnova.net/uganda>.
- e) National Renewable Energy Civil Society Organizations (NRECSOs) Network.

**Further information** about **Environmental Alert** is available at: <http://entalert.org/>

