Increasing Financing and Investments for Clean and Renewable Energy Access in Uganda; Policy and Practice Recommendations for Implementation at National and Local levels.

"This position paper is an output from several CSOs engagements coordinated by Environmental Alert with financial support from Norad within the framework of 'Increasing access to sustainable and renewable energy alternatives in the AlbertineGraben' that is implemented by WWF-Uganda Country Office."



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For more information, contact: Executive Director, Environmental Alert Tel: +256 414-510547 or 510215 Email: ed@envalert.org Website: www.envalert.org Plot 475/523 Sonko Lane, Kabalagala Off Ggaba Road







1.0 Introduction

This is a civil society organizations (CSOs) and Networks position paper (see Box 3) that presents views of CSOs and Networks in renewable energy sub sector in Uganda. It's largely based on the study on, 'Unlocking Financing and Investments for Clean and Renewable Energy Access in Uganda: A Case of the Albertine Region,' conducted by Environmental Alert, with financial support from WWF-UCO. It further presents targeted key practical policy and practice recommendations which are suggested for implementation by key stakeholders with an overall target of increasing financing and investments for clean and renewable energy access by all Ugandans. The study employed both qualitative and quantitative approaches – mainly through review of secondary data and analytical studies from various sources, including international databases, government documents, key informant interviews (KIIs) with over 44 people (6 Females and 38 Males) at national and local levels, and Focus Group Discussions (FGDs) with 49 people (5 Females and 44 Males) from 18 districts in the Albertine region. Two validation workshops were held on 17th May, 2017 and 17th July, 2018 with selected stakeholders including CSOs and Networks in Renewable energy, private sector, government (MEMED) and development partners. During these workshops, the research team presented the draft preliminary findings, conclusions and recommendations and facilitated discussion among the participating stakeholders around them.



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

2.0 Background and Rationale

Renewable energy is the most prevalent in electricity generation, 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, 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 (MEMD, 2015). Thus, majority of households depend on traditional biomass as a fuel source for primary energy demand. Traditional biomass consists of fuel wood, charcoal, tree leaves, animal dung and agricultural residues burnt for residential use.

The use of biomass is unclean and inefficient, 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). In addition, due to lack of electricity, majority of households use traditional lighting technologies such as candles or kerosene lamps that give poor quality lighting, emit noxious fumes and present hazards in terms of fires or burns. Furthermore, 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 of fuel wood (MWE, 2016). The National Forest Authority (NFA) estimates that Uganda has been losing 250,000 hectares of forests annually for the period 2005-2010 (MWE, 2016).

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 USD 2.6M. This cost does not account for the cost of transmission and distribution to deliver elec-

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tricity to end-users. Uganda's electricity household tariffs are currently USD 0.18 per kWh which is high for most households (Stephane de la Rue du Can et al, 2017) and is hampering energy access.

Box 1. Definition of Renewable Energy 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.

3.0 Key Findings

3.1 Renewable energy resources

Uganda has considerable unexploited renewable energy resources for energy production and provision of energy services. These resources include: Hydro (2,000 MW), Mini-hydro (200 MW), Solar (200 MW), Biomass (1,650 MW), Geothermal (450 MW), Peat (800 MW), and Wind (ERA, 2014a). Government is investing heavily in on-grid large scale hydroelectricity projects which will increase electricity production to over 3,247 MW over the next decade. 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, however, at present, solar PV electricity is not generated in sufficient quantities for inter-connection to the national (DFID & MEMD, 2016). More than 40 geothermal sites were studied, 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, 2016).

3.2 Current mechanisms for enhancing investment in renewable and clean energy

Numerous mechanisms are being used by government of Uganda, Development partners, private sectors and Non-Governmental Organisations to enhance investment in renewable and clean energy. Some of them include: GETFiT Programme, Energy Fund, Rural Electrification Fund (REF), Subsidies and incentives (such as energy rebates, long term developed Standardised PPAs, REFIT, and Clean Development Mechanisms), provision of Credit Support Instruments (CSIs) by Uganda Energy Credit Capitalization Company (UECCC); Provision of credit for renewable energy technologies (RETs) by commercial banks, Provision of soft loans by NGOs Quality control and certification by Uganda National Bureau of Standards (UNBS) and Uganda National Alliance for Clean Cooking (UNACC).

3.3 Current finance flows towards renewable and clean energy

Financing and investment towards renewable energy 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 and Organisation for Economic Co-operation and Development (OECD), total financing towards renewable energy sector in Uganda 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 (Figure 2). Hydro-electricity takes the largest chunk of financing followed by solar and to a small extent, biomass /bagasse cogeneration. In 2017/18, the large hydro infrastructure was allocated over two-thirds of the MEMD budget.



Figure 2: Financial Flows in the Energy Sector in Uganda (USD Million).

Source: Author's computations based on

data from MoFPED, OECD, & Electricity Regulatory Authority.

Although affordability challenges make off-grid power systems a better option for increasing access to energy, however, investment by government is still low. Government of Uganda and its development partners mainly focus on grid

extension, development of large hydro projects and to some extent large solar PV which has resulted into the lack of instruments oriented towards private financing of technologies for cooking, and off-grid that would impact the greatest (and poorest) proportion of the Ugandan population. However, Uganda can learn from countries such as Bangladesh which have been able to grow their off-grid electrification through public investment. In Bangladesh the growth of off-grid electrification has been led by public initiatives 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).

Box 2: Ghana Ssolar-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. Source: World Bank (2018).

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

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 available estimates provided in Rural Electrification Strategy and Plan the (2013-2022); and the Scaling-Up Renewable Energy Programme Investment Plan, are USD 950 million and USD 455.1 million is needed by 2030, respectively (REA, 2013) and Republic of Uganda, 2015b). It's important to note that these estimates underestimate the broad financing in the renewable energy 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.



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

3.5 Opportunities of financing and investment in renewable and clean energy

Domestic funding opportunities include: Government of Uganda (through MEMD-UGX 1,826.50 Billion in 2017/18), REA, and UECCC - US D 11.5 Million & UGX 2.21 billion); Development Partners (World Bank - USD 256.9 million, EU-ACP Energy Facility -EUR 10.6M, SIDA Uganda programme 2016-2020- USD 4.6 million, WWF - USD 2-3 million annually, AfDB – 14% of the entire portfolio of USD 1.1 billion, United Nations Development Fund (UNCDF) Clean Start Programme 2012 - 2018- \$4.8 Million); Global Energy Transfer Feed in Tariff (GET-FiT) Programme - EUR 93.6 million (committed); Financial Institutions and Private Sector (such as Post Bank, Centenary Bank -over UGX 1.5 billion, FINCA - Bright Life Finca, M-Kopa - invested over USD 30 million).

Some of the international financing opportunities include: Acumen (USD 7 – 10 million); DFID (private sector investment and innovation in low cost, clean energy technologies) (£116.5M); DFID (Energy Africa campaign) (£177M); UNCDF (USD26 M); Bamboo Finance (USD 20 M); Cross Boundary (USD 200 M); Embark Energy (USD 4.5 M); Energiya (USD 750); Fenix International (USD287 M); Gray Ghost Ventures (USD \$50 M); Invested Development (USD 20 M); Mosaic (USD125 M); and Sunfunder (USD 120 M). Other opportunities for investment in clean and renewable energy access include: Supportive policy and regulatory framework; Supportive Institutional framework; financially viable electricity sector; Carbon financing through CDM; and Potential of oil and gas revenues.

3.6 Key Constraints limiting financing and investment for clean and renewable energy

The constraints limiting financing and investment for clean and renewable energy can be analyzed at international, national and local levels.

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 behavior, fragmented funding landscape and a scattergun approach to projects, unfavorable taxation and subsidies regime which favor mainly large-scale electricity generation rather than small-scale renewable energy projects. GoU majorly focusses on 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) about their use and applicability.

4.0 Conclusions and Recommendation

4.1 Conclusions

Government of Uganda has made domestic and international commitments to increase access to modern energy services to all Ugandans. The abundance of renewable energy resources presents a great opportunity for Uganda to ensure energy mix by investing in all forms renewable energy. However, government efforts have largely focused on increasing energy access by increasing supply through investing in hydro-electricity and grid extensions. 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.

4.2 Recommendations

In line with the constraints discussed above that are limiting financing and investment for clean and renewable energy in Uganda, we propose the following recommendations in the **Table 1**:

Table 1: Policy and practice recommendations

Key Constraint	Recommendations
1. Low demand and high cost of elec- tricity. Investment in renewable energy is being affected by low power consumption and limited capacity of Ugandans to pay for electricity; most cannot afford the costs of connection to the grid and later on pay for the electricity.	 a. MEMD should 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. b. ERA should device means of reducing the feed-in tariff rates over time as renewables become more cost competitive with traditional energy sources. c. MEMD should increase funding in energy efficiency through for instance creating an energy efficiency fund and supporting innovation, research and development.
2. Policy and regulatory environment. The policy and rules around investing in renewable energy is at times unfavorable or confusing.	 a. MoFPED should put in place a stable and predictable taxation regime for the renewable energy sector. b. MEMD should develop and implement off-grid policy to facilitate the mainstreaming of off-grid systems and institutional solutions in the National Energy Policy.
3. Inadequate financing and access to credit. Potential developers, com- panies, and end-users (households and commercial enterprises) often lack awareness of available energy financing, and how to access it.	 a. 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. b. MoFPED should 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. c. Uganda Energy Credit Capitalization Company (UECCC) should raise awareness of on-lending facilities for RE projects among market participants. d. 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. e. Government should promote the mobilisation of funds through local sources such as energy cooperatives & VSLAs.
4. Focus on hydroelectricity. By invest- ing heavily in hydroelectricity projects, government is sending the signal to investors that other renewable energy sources are of low priority.	 a. 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. b. MEMD should ensure that the Energy Fund and the Petroleum Fund, are invested in the energy sector more broadly in solar, geothermal, and biogas. c. MEMD should promote and facilitate the off-grid power systems for purposes of breaking up the binding constraints towards energy access for all.
5. Capacity and institutional chal- lenges. There is shortage of qualified people to work on renewable energy projects, inadequate qualified and licensed technicians and wiremen.	a. MEMD should increase funding towards research and devel- opment (R&D) of renewable energy technologies. b. MEMD should invest in skills and training for clean off-grid system installation, repairs and maintenance.
6. Inadequate funding at LG levels. LGs do not have any budget alloca- tion for increasing access to clean and renewable energy.	 a. MoFPED &MEMD should allocate funds Local Governments to support the promotion of renewable energy investments at the lowest levels b. 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. c. LGs should recognise the energy sub-sector as part of the ENR and thus allocate funds and recruit staff to handle energy issues

Key Constraint	Recommendations
	within the LGs. A certain percentage of the ENR condition grant should be earmarked for RE. d. LGs should demand that oil and gas royalties are provide and invested in promotion of renewable energy investments.
7. Quality issues and consumer protec- tion. Several renewable energy prod- ucts and services still lack standards, and the quality control by UNBS is inad- equate.	 a. MoFPED provide financing to UNBS in order to effectively certify, monitor and enforce standards of all RETs. b. Parliament should expedite the passing of the Consumer protec- tion bill.
8. Unsustainable use of biomass. The low electricity access has increased dependency on traditional biomass, which has health, environment and gender implications.	 a. 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. b. MWE, MEMD, NFA and LGs should advance and upscale the green charcoal production and related regulation of charcoal production in Uganda. c. GoU and the Development Partners should support the implementation of the national biomass/charcoal strategy (2015).
9. Practice, knowledge and attitudes. Limited knowledge of RETs (such as solar and efficient cook stove), their use and applicability.	a. MEMD, LGs, DPs and NGOs should work together to increase massive targeted community awareness campaigns on RETs.
10. Advocacy by Environmental Alert and partners.	 a. Carry out a follow-up study on possible ideological flaws in the current approach by government in investing heavily in on-grid large-scale hydroelectricity projects. b. Engage the energy sector working group and Parliament (especially the committee on natural resources) to allocate more funds towards more investment in off-grid renewable energy options. c. Carry out a follow-up study on 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. d. Support DLGs to develop and pass ordinances on sustainable use of biomass, especially firewood and charcoal. e. Enhance coordination and engagement among CSOs on renewable energy issues.

5.0 References.

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Box 3. About CSOs & Networks engaging in the Renewable energy sub sector

These are Civil Society Organizations and Networks operating in the Renewable energy sub sector in Uganda. Currently they comprise of 30 including CSOs & networks and 120 CSOs engaging at the national level and sub-regional level within the Albertine Rift, respectively. Their focus is to promote access to and sustainable use of clean energy. Through collaboration with the WWF-UCO and with financial support from Norad they are being mobilized for enhanced coordinated by Environmental Alert for structured engagements with Government at National, Sub-National and Local levels towards contribution to improved access and sustainable utilization of clean renewable energy. This is within the framework of a 4 year project being implemented in 20 districts of the Albertine graben. The project is titled, 'Increasing Access to sustainable and Renewable Energy Alternatives in the Albertine Graben Project, 2017-2020.'

About Environmental Alert

Environmental Alert **(EA)** was founded in **1988** and in **2018** made years of contribution to improved livelihoods and development in Uganda through several interventions in sustainable agriculture, environment, natural resources management, water, sanitation and hygiene. 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 1st 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 the 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'

EA is a Secretariat for following networks:

a) The Network for Civil Society Organizations in Environment & Natural Resources Sector (ENR-CSO Network);

b) Uganda Forestry Working Group;

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).

e) National CSO Networks on Renewable Energy in Uganda (NACREU-Network).