



Upscaling Mini-grids for Least Cost and Timely Access to Electricity Services



SREP round table

[REA- Uganda]

Abuja, December 4-6 2017

Country Background



- Uganda is a landlocked located in East Africa with an area of 241,000 sq km
- Uganda's population is estimated at 37 million (8million households) of which 80% reside in rural areas. Projected to be 56 million in 2030 (11,956,636 households)

Institutional Arrangements



- **Ministry of Energy and Mineral Development** responsible for overall policy and strategies.

Website www.energyandminerals.go.ug

- **Electricity Regulatory Authority (ERA)**: it regulates the electricity industry. Website www.era.or.ug
- **The Rural Electrification Agency (REA)**: To accelerate Uganda's rural electrification programme. The Rural Electrification Fund (REF) under REA supports both private sector led and public sector led rural electrification based on grid extensions, independent mini grids and solar PV home systems. web site www.rea.or.ug
- **NEMA (National Environmental Authority)**: All electricity plants have environmental issues. An Environmental Impact Assessment (EIA) report will normally be required and cleared by NEMA as part of the licensing process.

Web site www.nemaug.org

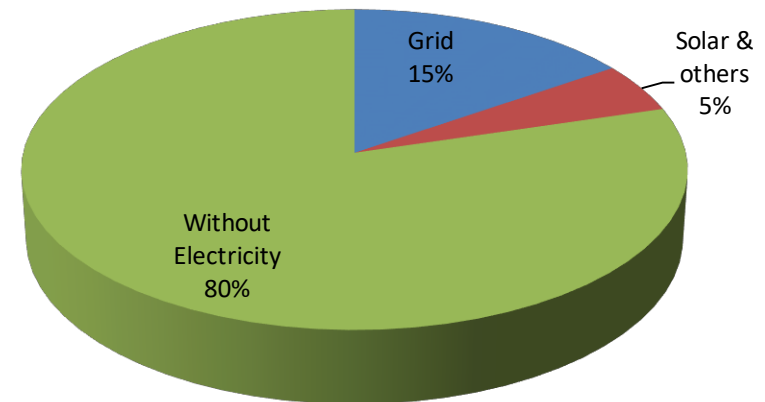
- **Uganda Electricity Transmission Company Ltd (UETCL)**: generation to sell electricity to the grid, the PPA will be signed with UETCL as the single bulk buyer. For small renewable projects the PPA is standardized .Website www.uetcl.com

Electricity Access



- The national grid electricity access rate stood at 16% (20.4% if solar is included electricity).
- In the rural areas 5.1% of households are connected to the national grid (Another 5.2% use off-grid solutions)

National Electrification Rate



Sources: National Population and Housing Census 2014

Rural Electrification



- Implementation of Electrification is guided by the Rural Electrification Strategy and Plan (RESP) for period 2013-2022.
 - The target is rural electrification access of 26% by 2022, translates to 1,415,000 new connections on grid and off-grid.
- The Strategy is implemented thru a combination of approached:
 - Grid extension
 - Mini-grids for concentrated settlements
 - PV standalone systems for dispersed and isolated

Potential for Off-Grid



- The scattered nature of settlements in Uganda, limit the population that will be reached by the grid.
- Off-grid will play a major role in increasing electricity access.
- Islands communities on Lake Victoria will gain electricity access through Off-grid solutions.
- SE4All estimate that to achieve universal access by 2030, 33% of the connections (3.3million) will be off-grid.
- Off-Grid implemented through:
 - ✓ Stand alone solar home systems and
 - ✓ Mini-grids

Stand alone Solar Home Systems



- Solar home systems are implemented through commercial approaches (Private Companies)
 - Cash sales
 - Pay as you Use
 - Credit
- Government Programmes
 - Testing facility and Standard development
 - Credit for users through participation financial institutions.
 - Grant financing for solar systems for post-primary institutions, health centres and water supply

Mini-grids Implementation



1. **Private Sector initiated**: mainly on the islands
 - REA Finance the distribution grid and connection cost
 - Apply to ERA for a license exemption for off-grid < 2MW
 - Legal Status
 - letter of support from REA for site and distribution grid
 - Business plan with proposed end-tariff
 - Consent & Approvals-NEMA and DWRM
 - Land Acquisition – Distribution grid and plant

Implementation of Mini-grids.....



2. Government initiated projects:

- As a result of the master planning process areas suitable for mini-grids are Identified
- Undertake pre-feasibility study
- Tendered to private sector for development
- For the selected company invests in generation and undertakes operation and maintenance:
 - REA provides the distribution grid and connections,
 - Subsidy on generation.

•Three pilot projects under procurement:

- ✓ 25 mini-grids in Lamwo (Northern Uganda); co-financed by EU and GIZ
- ✓ 15 mini-grids in Southern Service Territory; EOI to be published soon; co-financed by Germany govt thru GIZ
- ✓ 6 mini-grids in Western Uganda (Kasese district); co-financed by EU thru WWF

Benefits of Government initiated Projects



- Consolidates projects in a geographical area thus benefit from economics of scale and reduced operational cost.
- Addressed high end-user tariff through provision of subsidies.
- Streamline and shorten the licensing process
- Provide predictability of when the grid is likely to be extended to the area.

Current Status (Mini-grid Projects Implemented)



- i. WENERCo 3.5 MW- Hydro;
- ii. Kisizi 300 kW – Hydro;
- iii. Bwindi 64 kW – Hydro
- iv. Suam 40 kW – Hydro
- v. Kalangala Hybrid 600 kW (Solar) & 1 MW (Diesel)
- vi. Kabunyata 22.5 kW (Solar)
- vii. Kayanja 5 kW (Solar)
- viii. Kanyegaramire 13.5 kW (Solar)
- ix. Kyamugarura 13.5 kW (Solar)
- x. Tiribogo 32 kW (Biomass)
- xi. Ssekanyonyi 32 kW (Biomass)
- xii. Kagando Hospital (Hydro)
- xiii. Kitobo Island 230 kW (Solar PV)

Key Challenges



- Lack of public financing to implement mini-grids;
- Bureaucratic Licensing procedure by the Electricity Regulatory Authority
- Delay in developing the Off-grid Master Plan for the whole country;
- “What happens to the mini-grids” when the National Grid extends to the area served by mini-grids
- Political/Public pressure to keep tariffs low. However this is difficult to achieve for Mini-grids.

Progress made in addressing Challenges

- **Simplification of the process**
 - ❑ A Simplified license exemption application form was approved by ERA
 - ❑ Templates – project feasibility, business plan, financial model approved by ERA
- **Master plan** for the entire country being developed by REA.
- **REA together with GIZ under support from European Union and German Government piloting two mini-grid projects under reverse tendering.** Consolidation of REA Grid extension programme with identification of key suitable site to avoid scenario of when the Main Grid arrives.
- With the support from development partners, efforts are being made to subsidize the upfront costs to ensure that the tariff is affordable (under pilot projects).

Thank You for Your Attention !!!



Contact:

Rural Electrification Agency

Plot 10 Windsor Loop, Kololo, Kampala Tel:

+256 782617849

[Email: hsemaganda@rea.or.ug](mailto:hsemaganda@rea.or.ug) www.rea.or.ug