



REA'S OFF-GRID INITIATIVES TO ACCELERATE RURAL ELECTRIFICATION IN ZAMBIA

**By Eng. Patrick Mubanga
Director Engineering Services
Rural Electrification Authority**

OUTLINE OF PRESENTATION

1. Introduction

2. Off-Grid Projects - Existing and Under Implementation

3. Initiatives to Accelerate Rural Electrification – Private Sector

4. Lessons learnt

5. Conclusion

1. INTRODUCTION

- i. Rural Electrification Authority (REA) is a statutory body created through an Act of Parliament- Rural Electrification Act No. 20 of 2003.
- ii. Currently rural electricity access rate is 4.4% from grid power while 7.4% is from solar power (CSO 2015).
- iii. REA promotes renewable energy resources such as solar, mini-hydro, wind and biomass.
- iv. The **private sector participation** is considered to be key in the implementation of off grid technologies (e.g. mini-grids).

2. OFF-GRID PROJECTS - EXISTING AND UNDER IMPLEMENTATION

Existing: Mpanta Solar Mini- Grid

- i. 60 Kilo-watt peak (kWp) isolated solar mini grid located in Samfya District of Luapula Province;
- ii. Implemented as a pilot project and plant became operational in 2013;
- iii. Connected 450 private households, business entities and 2 public institutions;
- iv. The tariff charged is a fixed monthly fee which ranges from about US\$4 to US\$10.
- v. The power plant is managed using **a community-based model through Kafita Cooperative Society.**

Under Development: Chunga Solar Mini-Grid Project (200kWp)

- i. The estimated investment requirement is **approximately US\$1.2 million;**
- ii. Estimated Ability to Pay (ATP) is **US\$13.80 per month**
- iii. Cost Reflective Tariff is estimated at **US\$0.68**
- iv. **100% capital subsidy,** the estimated tariff for project reduces to US\$0.26/kWh
- v. Proposed Business Model for Management of Plant is a Public Private Partnership Model
- vi. **Status:** First Phase (civil works) has been completed. Second phase which includes the distribution and MV network is underway
- vii. The procurement of the developer is underway under the **Increased Access to Electricity and Renewable Energy Production (IAEREP)** Project

Under Development: Lunga Solar Mini-Grid Project (300kWp)

- i. The estimated investment requirement is approximately **US\$2.7 million**;
- ii. Ability to Pay is **US\$15.20** per month;
- iii. Cost Reflective Tariff is estimated at **US\$0.34**;
- iv. 100% capital subsidy, the estimated tariff for project reduces to **US\$0.18/kWh**;
- v. Proposed Business Model for Management of Plant is a **Public Private Partnership Model**.
- vi. Status: First Phase (civil works) are on-going
- vii. The procurement of the developer is underway under the IAEREP Project

Lunga Wind Assessment Project

- i. The results indicate a minimum of 5.5 m/s at 60 m when extrapolated at height of 117m6.8m/s
- ii. 200kW Single unit turbine could be installed
- iii. The study thus indicate that the wind resource may be adequate for the development and integration of the solar wind hybrid power plant

Kasanjiku Mini Hydropower Project (640kW)

- i. Located in Mwinilunga District of North Western Province
- ii. The estimated investment requirement is approximately **USD10 million**
- iii. Targeted number of connections – **2,250**
- iv. Estimated Ability to Pay (ATP) for households **US\$15.00 per month, for commercial US\$20.50**
- v. Cost Reflective Tariff is estimated at **US\$0.57**
- vi. 100% capital subsidy, the estimated tariff for project reduces to **US\$0.08/kWh**
- vii. Proposed Business Model for Management of Plant – **PPP Model**
- viii. Status: Awaiting technical commissioning

3. INITIATIVES TO ACCELERATE RURAL ELECTRIFICATION – PRIVATE SECTOR

- i. Capital subsidies in line with the REA Act
 - ii. Project feasibility studies to identify sites which could be offloaded to the private developer
 - iii. Public Private Partnership Models
 - a) IAEREP (Lunga, Chunga and Chishi)
 - b) Kasanjiku
- IV. Scaling-up Renewable Energy utilization**
- a) Electricity Service Access Project – ESAP (Smart Subsidy and Off grid Loan facility)
- V. GIS Least Cost Geo-spatial Electrification Plan Platform /National Electrification Strategy (ESAP)**

4. LESSONS LEARNT

- i. **High cost of developing mini-grids** – REA has to provide a capital subsidy.
- ii. High cost for **undertaking feasibility studies**
- iii. Due to the high cost and **specialised knowledge required** there is need to partner with institutions involved in RE technologies for purposes of building capacity in renewable energy.
- iv. There is need to **have anchor loads** capable of paying a cost reflective tariffs to meet the costs of operation and maintenance of mini-grids.
- v. Private sector is more interested in **on-grid renewable energy projects.**
- vi. **High Population Density** is critical factor for Mini-grid development

5. CONCLUSION

- i. The Rural Electrification Authority still **has a huge task of electrifying all rural areas of Zambia** and implementation of Renewable Energy technologies is key in accelerating rural electricity access rate.
- ii. The Authority cannot undertake this mammoth tasks alone , there is need therefore **to partner with the Cooperating Partners and the Private Sector**

60kW MPANTA SOLAR MINI GRID PLANT



MPANTA SOLAR MINI GRID BENEFICIARY



POWER HOUSE

