Role of Mini-grids in Kenya’s Universal Access: Status and Future

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Setting out the challenge

- SDG 7 targets universal access to “affordable, reliable, sustainable and modern” energy services by 2030.

- Kenya’s Vision 2030 blueprint has identified energy as a key enabler in transforming the country into an industrialized, middle-income economy as envisioned blueprint, Vision 2030.

- It is in this line that the country targets universal access by 2022. This more than 70% connectivity realized in 2020.
Setting out the challenge

**Need for access**

- Distribution Licensee is extending its grid in some areas, but the timing of this is uncertain due to funding and other factors.
- Private mini-grids can provide an interim solution in some areas, although probably cost more than Distribution Licensee.
- Distribution Licensee may arrive later at the mini-grid and offer cheaper electricity.
- Distribution Licensee can buy the mini-grid assets.

▶ **Customers should be able to benefit from the cheapest electricity available, whenever it is available.**

- This may be a private mini-grid for a time, then KPLC’s supply.

Mini-grids provide a higher quality and cheaper solution than SHS, and support productive uses.
The importance of mini-grid development in Kenya

Mini-grids are playing an increasingly important role in increasing energy access for Kenyans.

- Very rapid deployment
- Low running costs
- Limited energy supply potential
- Expensive source of electricity

Solar home systems

Mini-grids

- Deployable almost anywhere
- Able to meet increasing demand
- Typically very reliable service
- Customers will pay moderate prices
- Can be interconnected with main grid

Main grid extension

- Currently cheapest power supply
- Service can be unreliable
- Unpredictable timing for connection

Kenya has 192 private mini-grids, including 44 isolated systems with own generation.
2022 UNIVERSAL ACCESS STRATEGY

Off-grid Zone
Targeted for off-grid Mini grid electrification program

Last Mile Project
- Funded by the Government with support from various development partners
- Targets customers living in rural and peri-urban areas
- Government has secured funding from development partners totaling KShs 65 billion.

KOSAP Project
- Supports development of solar hybrid power supply complemented by water projects in 14 least electrified counties.
  - Target Population is about 430,000 households within off grid regions
  - The project is being financed by the World Bank to the tune of KShs.16 billion

Incorporated the new DG
Added additional job cadres: PA and DDP
Updated abbreviations: PRC to PPARC

• Targeting connection of 1.2 million customers over the next three years.
• Last Mile Connectivity Program aims to provide 75-80% of Kenyans with electricity

• Its estimated that about 1.3 million households will be served by off-grid mini grids
• 120 potential mini and micro-grid sites (>100 structures per site) with roughly 28,000 customers targeted for phase 1.
In Kenya, mini-grids are currently owned either by public entities or the private sector.

Those owned by public entities include those owned by REREC and operated by KPLC.

Several private developers have also entered the space of mini-grid development.

The 2018 Kenya National Electrification Strategy (KNES) aims to achieve universal electrification by 2022 and mini-grids are seen as an important step towards achieving that target.

New mini-grids are expected to supply an additional 34,700 households by 2022.
SCOPE/CONTEXT

Micro-grid model

Solar energy

PowerGen RENEWABLE ENERGY

Electrical energy through distribution wires

Home

Home

Business

Cloud Data

Mobile money payments

EPRA
Why do we need dedicated Mini-Grid Policies and Regulations?

• Currently, mini-grids are regulated under the existing energy regulatory regime which does not segregate between grid power connection and mini-grids

• This has impacts for licensing, tariff determination, and technical standards, among other things

Providing a clear and transparent regulatory framework for mini-grid operators establishes a requirement regarding technical standards, worker and customer safety protocols and encourages prudent operation of mini-grids
Current Status

The number of mini-grids operating in Kenya will need to grow significantly over the next years to achieve the targets set by the KNES

Overview of existing and planned mini-grid sites until 2022

- 152 mini-grids have been planned under the Kenya Off-Grid Solar Access Project (KOSAP) and will be operated by REREC or KPLC
- The private sector is planning over 130 mini-grids, currently at various stages of development but to be commissioned before 2022
Tariff Review Methodology

• EPRA developed a Standardized Tariff Application Model (TAM) with the support of Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH in 2017

• The model is based on a Rate of Return (RoR) methodology also know as cost of service/ cost plus regulation

• Model has led to standardization of some of key components of the Revenue Requirements

• Revenue Requirements = (RB*RoR)+E+T+D
COMPONENTS OF REVENUE REQUIREMENTS

- Rate of Return (based on capital structure and allowed return for debt and equity)
- Rate base (long term assets)- Return is earned on the RAB
- Expenses (Opex)
- Taxes
- Depreciation (Recovery of Rate base) (assumes 20 year license period)
Scatter Plot of Tariff approved for Different sites- Domestic Category
Scatter Plot of Tariff approved for Different sites- Commercial Customer Category
Draft regulations – application process

Site reservation / EOI (Section 5)
- Approval by Cabinet Secretary
- EPRA decision within 60 days of any hearing
- Concurrent with the Tariff application

Tariff application (Section 5(6), 6)
- Within 12 months of agreeing the MoU
- EPRA notification of receipt within 15 days
- EPRA decision within 60 days

Licence Application (Section 8)
- After 50% of generation commissioned and 30% consumers connected
Application process – site reservation and EOI

Site reservation / EOI (Section 5)

- Site description
- Technology
- Pre-feasibility study
- Grid integration plans
- Capacity to implement
- Community engagement
- Host County no objection
- Proposed tariff
- Alignment with KNES

Received and approved by Cabinet Secretary (Ministry of Energy)

CS must approve within 21 days

Next steps (upon approval):
- Agree a Memorandum of Understanding
- Enter Energy Supply Agreement with Distribution Licensee (interconnected mini-grid only)
- If no tariff application made within 12 months, reservation expires
Application process – tariff application

Tariff application (Regulation 6) → Received and approved by EPRA → EPRA must notify within 15 days, and decide within 60 days

- Approval from the Host County Government;
- Expression of Interest approval issued by the Cabinet Secretary;
- Duly completed Mini-Grid Tariff Model;
- Feasibility Study Report;
- Project approval by the National Environmental Management Authority;
- The Memorandum of Understanding, a document endorsing appointment of Community Representatives, and minutes and attendance register of the meeting confirming the appointment;
- Proof of land ownership (Title Deed or Lease Agreement) for the proposed generation plant location;
- Source of financing for the Mini-Grid
- Corporate information

Within 12 months of MoU

EPRA must notify within 15 days, and decide within 60 days
Application process – Mini-Grid Licence

- Physical Planning Approval issued by the Host County Government;
- Public Notice in two (2) local newspapers of wide circulation;
- Evidence of a physical office accessible to the consumers and other stakeholders or of dedicated on-site staff and a customer service;
- Proposed Consumer Supply Contract;
- Proposed Consumer Service Charter;
- Way leave/Easement agreement(s) for the Distribution Network;
- Proposed Consumer Complaints and Dispute Handling Procedure

EPRA must decide within 60 days

Commission 30%
Other Provisions

- Site Relinquishment
- Performance Standards and Reporting
- Health, Environmental and Safety Obligations
- Insurance
- Accounts and Records
- Handling of Compliances
- Accident/Incident Reporting
- Mini-grid Encroachment
- Local Content
Thank You

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