Sustainable Rural Electrification Projects: Tariffs for Mini-Grids

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Background

• National electricity access is at 21.2% (16%- on-grid and 5.2% - Off-grid).
• Only 10.3% of the rural households have access to electricity (5.1%-on-grid while 5.2% - off-grid/solar) . Source: Census 2014
• The electricity sector was unbundled into generation, transmission and distribution following enactment of the Electricity Act 1999.
• The generation companies sell electricity in bulk to transmission company which in turn sells it to distribution companies
• The Electricity Act 1999 also provided for the establishment of a Sector Regulator and the Rural Electrification Agency (REA)
• The government intends to increase rural electricity access to 26% by 2022 by adding 1.28 million new grid connections and 140,000 off-grid connections. It also aims to achieve Universal access by 2040.
Role and Attributes of REA

- REA is responsible for building the evacuation power lines for generation stations below 20MW.
- It operationalizes the government’s rural electrification function under a public-private partnership framework.
- It functions as the secretariat of the Rural Electrification Board, which carries out the rural electrification responsibilities, as per Electricity Act of 1999.
Legal Framework on Tariffs

• The Electricity Regulatory Authority (ERA) is responsible for setting and approving Electricity Tariffs in Uganda
• The ERA’s functions are spelt out in the Electricity Act 1999 and include:
  ✓ To issue Licenses for Generation, Transmission, Distribution or Sale of Electricity;
  ✓ Establish a tariff structure and investigate charges, whether or not a specific complaint has been made for a tariff adjustment;
  ✓ Approve the rates of charges and terms and conditions of electricity services provided by transmission and distribution companies.
  ✓ To develop and enforce performance standards for the generation, transmission and distribution of electricity.
The Tariff Setting Process

- ERA regulates both the levels and structures of the electricity tariffs and is in the process of issuing guidelines for tariff setting that must be followed by all operators.
- Under the current price setting structure, ERA determines the revenue requirement for each Operator and applies a Rate of Return (ROR) regulation principles.
- Considerations are made on affordability & cost recovery for prudently incurred costs by the Operators.
- On a quarterly basis, the tariffs are adjusted to allow for a pass-through of the changes in fuel prices, inflation and exchange rates.
Tariff Structure

• For grid connected consumers, electricity prices are set at three points in the industry:
  ✓ At the interface between generation and transmission;
  ✓ At the interface between transmission and distribution;
  ✓ At the interface between distribution and end-user consumers.

• End-User customers categorized as;
  ✓ Domestic consumers- tariff -20 cents/kWh
  ✓ Commercial consumers - Time of use tariffs.
  ✓ Medium Scale Industries - Time of use tariffs.
  ✓ Large Scale Industries - Time of use tariffs.

• Note: Time of Use Tariff: Peak, Shoulder and Off-peak
Off-Grid (Tariff Structure)

- Solar home systems and Mini-grids
- The private sector dominates the off-grid market in Uganda.
- Mini-grid operators are allowed to charge higher tariffs than on-grid operators but it is still regulated/set by ERA (to balance cost-reflectiveness and affordability).
- Mini-grids under 2 MW have license exemption from ERA
- Solar PV - Tariff is unregulated and set by the PV system distributor/seller
- There is no specific mini-grid regulation or policy hence a number of concerns around licensing, tariffs, and costs.
- ERA determines the mini-grids tariff but the project developers feel that in many instances the tariff set by the ERA is too low (on average 45 cents/kWh) to ensure project viability.
RE Feed-In-Tariff (REFIT)

- The REFIT is applicable to small-scale renewable energy systems, up to a Maximum Installed Project Capacity of 20MW, and greater than 0.5 MW, as defined by the Electricity Act 1999.
- Only applicable on grid connected projects (No support to Off-grids)
- The Priority renewable technologies for REFIT include:
  - Small hydro power plants up to 20MW;
  - Bagasse power generation;
  - Wind.
- ERA continually reviews and adjusts these tariffs at least every after two years.
## RE Feed-in- Tariff 2016

- **The Revised FiT applicable 2016-2018**

<table>
<thead>
<tr>
<th>Technology</th>
<th>Tariff (US$)/kWh</th>
<th>O&amp;M %age</th>
<th>Cumulative Capacity Limits (MW)</th>
<th>Payment Period (Yrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td>2017</td>
</tr>
<tr>
<td>Hydro (10 &gt; = 20 MW)</td>
<td>0.094</td>
<td>10.96%</td>
<td>30</td>
<td>60</td>
</tr>
<tr>
<td>Hydro (5 &gt; = 10 MW)</td>
<td>Linear Tariff</td>
<td>10.49%</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>Hydro (500kW &gt; = 5 MW)</td>
<td>0.107</td>
<td>10.49%</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Bagasse</td>
<td>0.088</td>
<td>29.78%</td>
<td>30</td>
<td>50</td>
</tr>
<tr>
<td>Wind</td>
<td>0.122</td>
<td>10.71%</td>
<td>25</td>
<td>50</td>
</tr>
</tbody>
</table>

- **Source: ERA-Uganda**
Impact of REFIT in Rural Electrification

• Increased energy production
• Facilitated energy access to over 200,000 households
• Increases Private sector investments in RE projects.
Tariff Study

- **Study**: Cost of service and affordability of tariff studies (Funded by AfDB) – 10 months study
- **Status**: Consultant is on board (Contract -signed)- No deliverables yet
- **Objectives of the Study**:
  - To prepare an Economic Regulation Framework (ERF),
  - To develop and recommend an appropriate tariff setting/pricing methodology,
  - To develop and recommend an appropriate Tariff structure and tariff model tools,
  - To develop guidelines for determining capital expenditure allowance (Investments), operations and maintenance costs expenditure, treatment of Grants and Capital Contributions and valuation of assets added to the Regulatory Asset Base,
  - To develop a standardized/prototype new customer connection policy to be operationalized by distribution and supply companies,
  - To design appropriate tools for compliance monitoring of the financial and commercial performance of distribution and supply licensees;
  - To determine the affordability of tariff at national level and service territories; and
  - To build the capacity of selected ERA staff to operationalize the developed tariff model and compliance monitoring tools.
Other Mini-grids Activities-Tariff

• Mini-Grids Financial Model (MEMD, REA, ERA & GIZ)
  ✓ Calculates Appx costs of Installation and Operation of Mini-grids
  ✓ Mini-grids Tariff calculations from the predicted costs
  ✓ To be piloted in Pro-Mini-grids projects financed by EU and GIZ
THANK YOU