ZAMBIA COUNTRY EXPERIENCES
ON TARIFF MODELS, TARIFF CALCULATION AND PRICING

Presentation made to the 13th Annual General Meeting of the African Association For Rural Electrification (Club – ER)

Lusaka, Zambia

By

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Director Economic Regulation

September 2017
1.0 Mandate

2.0 Functions

3.0 Tools of Regulation

4.0 ERB Tariff Review Principles

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8.0 Key Performance Indicators

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10.0 The REFIT Programme – Regulatory Support

11.0 Challenges under Current Framework

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1.0 Mandate

- The Energy Regulation Board (ERB) is a statutory body established by an Act of Parliament to regulate the provision of energy services and products.

- The mandate to regulate the sector is derived from The Energy Regulation Act, Cap 436 of the Laws of Zambia

- Mandated to regulate all undertakings in energy sector – electricity, fossil fuels and other forms of energy (including renewable energy).
Mandate of the ERB

- Responsible for regulating:
  
  - Pricing;
  - Quality of service; and
  - Quality of product
  - Financial viability of projects.

- ERB has the authority to review electricity tariffs and petroleum prices - Energy Regulation Act Cap 436.
2.0 Functions

- Approve location and construction of energy facilities
- Receive and investigate complaints
- Regulate competition in the sector
- Develop standards
- Environmental impact
- Monitor efficiency and performance of licensees
- Issue licences

Functions:

- (Generation, Transmission, Distribution, Supply), approve the **tariffs**, and **Power Purchase Agreements (PPAs)**
- Advise the Minister
3.0 Tools of Regulation

- Energy Regulation Act as amended;
- Electricity Act as amended;
- Tariff Filing Guidelines;
- Electricity Licenses;
- Standards and Codes;
- Energy Policy; Statutory Instruments, Board Directives, and
- Key performance Indicators
4.0 ERB Tariff Review Principles

✓ Recovery of prudently incurred costs by the Utility;

✓ Recognition of used and useful Utility assets only;

✓ Financial sustainability of the Utility;

✓ The need to attain cost reflective tariffs;

✓ Delivery of quality service; and

✓ Social considerations for the indigent customers.
5.0 Tariff Review Process & Methodology

- ERB authority to determine tariffs is enshrined in section 8 of the Electricity Act Cap 433.

- Tariff Filing Guidelines (TFG)

**Process**

- Utility applies to the ERB for a tariff review;

- ERB grants no objection to Utility if duly lodged;

- Utility issues 30 days Notification to the public;

- ERB issues a Public Consultation Paper (PCP) highlighting tariff application and invites submissions from the public;

- Public hearings;

- ERB undertakes detailed analysis and review; and

- Board Decision (90 days as per TFGs)
Revenue Requirement =

- Operational & maintenance Costs
- Taxes
- Depreciation (straight line)
- Rate of Return X Asset Base

Revenue Requirement (per customer category)

- Expenses - just and reasonable – Non-core business expenses are disallowed, unreasonable expenses are adjusted – financial / economic statements critical
- Assets should be used and useful - asset valuation very critical
- Rate of return and other macro-micro economic assumptions are critical
- Load forecast critical
Tariff Review Process

- Allow only **prudent business expenses** exclusively used for the provision electricity;

- Costs and Capex Investments must be prudently incurred;

- **Benchmarking** – staff costs, rate of return, Plant maintenance costs;

- Trend Analysis and adjustment of costs lying out of the ‘normal’;

- Assets should be **used and useful**; and

- Use of **KPIs** as tariff incentives.
Key data and Information for Tariff calculation and Pricing

- An unambiguous, clear legal mandate;
- A predictable transparent regulatory framework;
- An up-to-date Cost of Service Study (2006, now 2017);
- Detailed Utility performance and Capital investment plan (IRP)/ asset values;
- Audited Financial statements;
- A robust set of tariff setting rules – TFGs, Tariff calculation model etc;
- A timely forward looking tariff adjustment/Migration plan;
- Incentive scheme (e.g KPIs) is required to balance stakeholder needs/expectations.
6.0 ERB Tariff Decisions 1998 - 2017

<table>
<thead>
<tr>
<th>Month</th>
<th>Average % Applied for</th>
<th>Average % Approved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan.1998</td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>Oct.1998</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Apr.1999</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Apr.1999</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Apr.2000</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Jan.2003</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Apr.2005</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Dec.2007</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Jul.2009</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>Jul.2010</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>Jul.2014</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>May.2017</td>
<td>75 75</td>
<td>75 75</td>
</tr>
</tbody>
</table>
Zambia has a two-part tariff structure that provides for Fixed monthly charges and Energy charges. This has made it possible to provide for a Life-line tariff for indigent consumers. The Current Tariff structure is as shown below:

<table>
<thead>
<tr>
<th>CUSTOMER CATEGORY</th>
<th>CONSUMPTION BANDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.RESIDENTIAL</td>
<td>1. Energy Charges /kWh</td>
</tr>
<tr>
<td></td>
<td>i. R1: 0 – 200 kWh</td>
</tr>
<tr>
<td></td>
<td>ii. R2: Above 201 kWh</td>
</tr>
<tr>
<td></td>
<td>2. Fixed Charge/Month</td>
</tr>
<tr>
<td>2.COMMERCIAL</td>
<td>1. Energy Charge/kWh</td>
</tr>
<tr>
<td></td>
<td>2. Fixed Charge /Month</td>
</tr>
<tr>
<td>3.SOCIAL SERVICES</td>
<td>1. Energy Charge/kWh</td>
</tr>
<tr>
<td></td>
<td>2. Fixed Charge /Month</td>
</tr>
<tr>
<td>MAXIMUM DEMAND 1 - 4</td>
<td>1. Energy Charge/kWh</td>
</tr>
<tr>
<td></td>
<td>2. Fixed Charge/Month</td>
</tr>
<tr>
<td></td>
<td>3. MD Charge/kVA/Month</td>
</tr>
</tbody>
</table>
8.0 Key Performance Indicators

*Key Performance Indicators (KPIs)*:

1. **Customer metering (10%)**
2. **Cash management (20%)**
3. **Staff Productivity (15%)**;
4. **Quality of Service (20%)**;
5. **System Losses (10%)**;
6. **Power Generation (5%)**;
7. **Safety (5%)**;
8. **Resolution of Consumer Complaints (10%)**; and
9. **Equipment Failure (5%)**
## KPI Tariff Award Rules

<table>
<thead>
<tr>
<th>SCORE</th>
<th>RULE</th>
</tr>
</thead>
<tbody>
<tr>
<td>75% - 100%</td>
<td>One hundred percent (100%) of the ERB determined tariff would be awarded</td>
</tr>
<tr>
<td>50% - 74%</td>
<td>Seventy five percent (75%) of the ERB determined tariff would be awarded</td>
</tr>
<tr>
<td>25% - 49%</td>
<td>Fifty percent (50%) of the ERB determined tariff would be awarded</td>
</tr>
<tr>
<td>00% - 24%</td>
<td>Twenty five percent (25%) of the ERB determined tariff would be awarded</td>
</tr>
</tbody>
</table>
9.0 Regulation of Power Purchase Agreements

- Tariffs under the Power Purchase Agreements (PPA) are negotiated between the two Contracting parties;
- The ERB is not involved in the negotiations;
- The parties submit draft PPA for regulatory approval by ERB;
- The PPA must provide for Tariff indexation over the life of the PPA; and
- The ERB undertakes legal, financial/economic and technical review on the Basis of PPA Review Guidelines and grants regulatory approval if all requirements are met.
ERB has developed Standardized documents up to 20 MW

- Standard PPA;
- REFIT Rules;
- Model Grid Connection Agreements;
- Standardized Licence;
- REFIT Guidelines: Support Mechanisms and Regulations
Indicative Benchmark Cost-reflective REFIT for Solar PV and small Hydro Projects applicable for Phase 1 of REFIT, with price discovery allowed below the benchmark.

<table>
<thead>
<tr>
<th>Plant Size Range</th>
<th>Small Hydropower</th>
<th>Solar PV</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 kW to 1 MW</td>
<td>13.98</td>
<td>17.82</td>
</tr>
<tr>
<td>1+ MW to 5 MW</td>
<td>9.53</td>
<td>16.76</td>
</tr>
<tr>
<td>5+ MW to 10 MW</td>
<td>9.53</td>
<td>15.74</td>
</tr>
<tr>
<td>10+ MW to 20 MW</td>
<td>8.05</td>
<td>14.25</td>
</tr>
</tbody>
</table>
11.0 Challenges under Current Framework

- Under the current framework, ERB has to wait for an Application from the Licenccee;

- Annual Reviews have proved to be cumbersome and costly;

- Current framework is not responsive to emergency situations e.g emergency cost pass through and automatic tariff adjustments because of the need to undertake Public consultations;

  ✓ Proposed Multi-Year Tariff Regulation Methodology
  ✓ Proposed Automatic Cost-pass through mechanism (Exchange rate, cost fuel etc)

- TFG requirements not suited to small Off-grid operators – Light handed regulation is in place;
12.0 Conclusion and key success factors

- Tariff determination is not a pure science, it incorporates financial, economic, consumer/social, investment and political perspectives as maybe demanded by specific Country circumstances;

- **However, the Key success factors are common across Countries**

- **Transparency** is critical in order to ensure buy-in;

- A **phased approach** to migrating tariffs to cost reflective levels is important to forestall tariff shocks; and

- A framework (e.g. KPIs) to hold the Utility accountable to improving service delivery is necessary to balance customers’ need and Utility’s needs; and

- Timing of commencement of **migration and consistency** are critical to attract/incentivise new investments and also to avoid huge increases in future.
THANK YOU FOR YOUR ATTENTION

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