



Summary of Approved Regulatory Framework for Mini-Grids in Zambia

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The ERB in October 2018 approved a regulatory framework for mini-grids in Zambia.

This framework will be "road tested" from November 2018 onwards. Results from road-testing (*inter alia* resulting from Rural Electrification Agency (REA) demonstration projects and other solicited and unsolicited bids) will be incorporated in regulations to be *Gazetted*.

The regulatory framework was developed by a mini-grid team of EU supported consultants¹ and ERB officials, in consultation with key stakeholders, including government, private sector, civil society and development partners.

The package of the Mini-Grid Regulatory Framework comprises of the following documents:

1. Executive Summary of the licensing and regulatory framework;
2. Rule on Tariffs Applicable to Mini-Grids in Zambia;
3. Technical Requirements for Mini-Grid in Zambia.

Supporting documentation is available upon request from the ERB

The key ERB decisions can be summarised as follows:

Regulatory/licensing approach²

ERB Decision One: That there are three categories of mini-grids for purposes of the Electricity Act (EA) and the Electricity Regulatory Act (ERA) , namely <100kW, between 100kW and 1MW, and >1MW. This provides the opportunity to differentiate between mini-grids based on size and complexity.

ERB Decisions Two, Three and Four: That the different sizes of mini-grids all be licensed, but that there is differentiation in the *manner* how they are regulated. Mini-grids <100kW will be licensed in a "*very light-handed manner*", between 100kW and 1MW in a "*light-handed*" manner, and >1MW in a manner similar to the grid. The differentiation would lie especially in how tariffs are regulated, what standards need to be complied with, and compliance and monitoring requirements for the different sized grids.

Decision Five: That consideration will be given by the ERB to the development of an establishment licence in addition to an operation licence. Currently, only operational

¹ The EU supports the GRZ through EDF Service Contract No. FED/2018/395-092 entitled "Increasing Access to Electricity and Renewable Energy Production."

² Background to the decisions are provided in the Mini-Grid Regulatory and Licensing Framework Report

licences are issued, whilst the EA and the ERA also authorises establishment licences. This would be ancillary to the current practice of Investment Endorsement Letters and would serve to provide further surety to investors and developers. As this requires regulatory changes, this is a longer-term objective.

Decision Six: That all mini-grid licences are issued as combined generation, distribution and supply licences. Individual developers would still have the choice to apply for separate licences should the need dictate.

Decision Seven: That in order to address one of the key concerns for developers and financiers, namely the possibility of grid encroachment, the ERB will try and address this to the extent possible via the current licensing framework in that a) mini-grid licences will be issued for a fixed term (maximum 20 years) b) the geographical licensed area for the licensed term will be defined and set out in the licence and c) the mini-grid on application may be given exclusivity of supply in greenfield areas for a pre-defined period³.

Decision Eight: The ERB will consider simplifying process-type issues that could be simplified and developed within the constraints of the present EA and ERA to assist mini-grid developers.

³ Only greenfield areas as in other areas there would already be another licensee that would overlap mini-grid generation, distribution or supply activities.

Tariff Recommendations

Consistent with the licensing, there are three categories of tariffing processes. These are summarized in the table below.

	0-100 kW Category I	100 kW - 1 MW Category II	> 1 MW Category III
Tariffs	<ul style="list-style-type: none"> Exemption from formal tariff regulation; Submission of financial and sales data to ERB for information purposes only. 	<ul style="list-style-type: none"> By default, ERB does not commence a detailed tariff review for Category II Mini-Grids; Developers are asked to provide 5-year tariff levels and escalation rates to be applied to Mini-Grid customers; ERB uses an in-house modelling tool to check the reasonableness of tariff request; Once tariffs are approved they stay fixed, in real terms, for the duration of the “regulatory period” of 5 years, not adjusted if changes are within a “materiality threshold”; ERB may trigger a detailed tariff review for Category II Mini-Grids, if it considers tariffs unreasonable 	<ul style="list-style-type: none"> Tariffs regulated in 5-year regulatory periods during Periodic Reviews. Allowed revenues calculated according to the building-block approach (sum of depreciation, allowed revenues, operating and maintenance costs); Allowed revenues include working capital, collection debt and allowed losses; The reasonable return is calculated based on weighted average cost of capital, which sets cost of debt equal to the actual rate of financing; Interim review can be triggered under exceptional circumstances, depending on a “Materiality threshold”.
Tariff level	<ul style="list-style-type: none"> Cost-reflective 	<ul style="list-style-type: none"> Cost-reflective 	<ul style="list-style-type: none"> Cost-reflective
Tariff structure	<ul style="list-style-type: none"> Unregulated 	<ul style="list-style-type: none"> ERB sets principles only. Operators apply for tariff levels. Operators free to propose structure of tariff or service charge so long as such a proposal meets general principles outlined in the rule 	<ul style="list-style-type: none"> ERB sets principles only. Operators apply for tariff levels. Operators free to propose structure of tariff or service charge so long as such a proposal meets general principles outlined in the rule

Technical Requirements Recommendations

Mini-grids in Zambia shall comply with the Technical Codes of Zambia, unless these requirements require other codes or standards or in absence of national Technical Codes, or MGD demands for exemption from complying with any provision of the Technical Codes.

Mini-Grid Developers can in absence of national standards refer to international accepted recommendation, codes and standards.

To ease development works for Mini-grids in Zambia, we recommend establishing three clusters:

Cluster Description
<p><u>Cluster 1</u></p> <p>Any Mini-grid generation capacity powered by a Hydropower plant has to comply with the Technical Codes at time of application, connection and operation and demonstrate Main Grid readiness at any time. Cluster 1 Mini-Grids are AC Mini Grids at 50hz.</p>
<p><u>Cluster 2</u></p> <p>Any Mini-grid powered by e.g. PV Solar, Wind or Bio with a generation capacity of greater than 10 kW, but less than or equal to 100 kW apply to these Regulations and have to demonstrate Main Grid readiness within 24 months after after agreement with Main Grid operator and notice of the ERB. Any Mini-grid powered by PV Solar, Wind or Bio with a generation capacity of greater than 100 kW has to comply with the Technical Codes at time of application, connection and operation and demonstrate Main Grid readiness at any time. Cluster 2 Mini-Grids are AC Mini Grids at 50hz with a three-phase distribution grid at 400V.</p>
<p><u>Cluster 3</u></p> <p>Any Mini-grid powered by PV Solar, Wind or Bio with a generation capacity of equal or less than 10 kW apply to these Regulations. Cluster 3 Mini-grids are either AC Mini-grids at 50hz with a single-phase distribution grid at 220V or DC Mini-grids. DC Mini-grid with a generation power of equal or less than 2 kW can operate at 24V. DC Mini-grids with a generation power of greater than 2 kW but equal or less 10 kW can operate at 48V or 72V.</p>

Within these three clusters the developers benefit from exclusions of technical requirements, which are listed in the following table.

Standard	≤2 kW AC/DC	≤10kW AC/DC	> 10kW AC	> 100kW AC	> 1.000kW AC
1. Project Planning	+	+	+	+	+
2. Environmental Assessment Study					
PV	-	-	-	-	+
Wind	-	-	-	(+)	+
Hydro	-	-	+	+	+
Bio	-	-	+	+	+
3. Construction	+	+	+	+	+
4. Generation and Storage	+	+	+	+	+
5. Distribution of energy	(+)	(+)	(+)	(+)	(+)
6. Consumer connection and wiring	+	+	+	+	+
7. Metering	(+)	(+)	(+)	+	+
8.					
Health	+	+	+	+	+
Safety - Physical Security	+	+	+	+	+
Cyber Security	-	-	-	+	+
Environment	-	-	-	+	+
9. Assets Protection	+	+	+	+	+
10. Performance Reporting to ERB	(+)	(+)	(+)	+	+
11. Grid Connection	-	-	(+)	+	+

Legend to Table:

“+” means the Mini-Grid Developer (MGD) has to fully comply with the Zambian Technical Codes or the ERB reporting.

“(+)” means the MGD has to partially comply with the Zambian Technical Codes or the ERB reporting.

“-” means the MGD is excluded from application of Zambian Technical Codes or the ERB reporting.

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