



Mini-grid Regulations for Zambia

Licensing, Technical and Tariff

Presented by Mr Boyd Chilembo, Energy Regulation Board

Beyond the Grid Fund for Africa Workshop

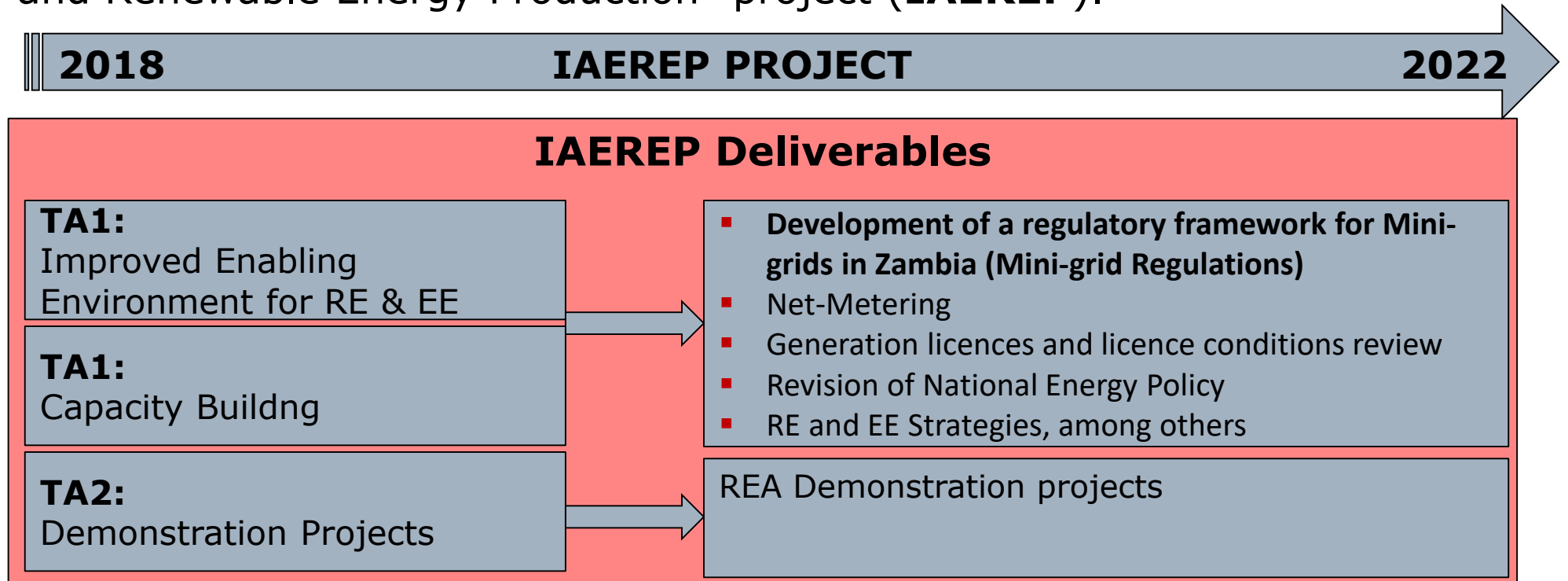
Neelkanth Sarovar Premier Hotel

Lusaka, Zambia

17 September 2019

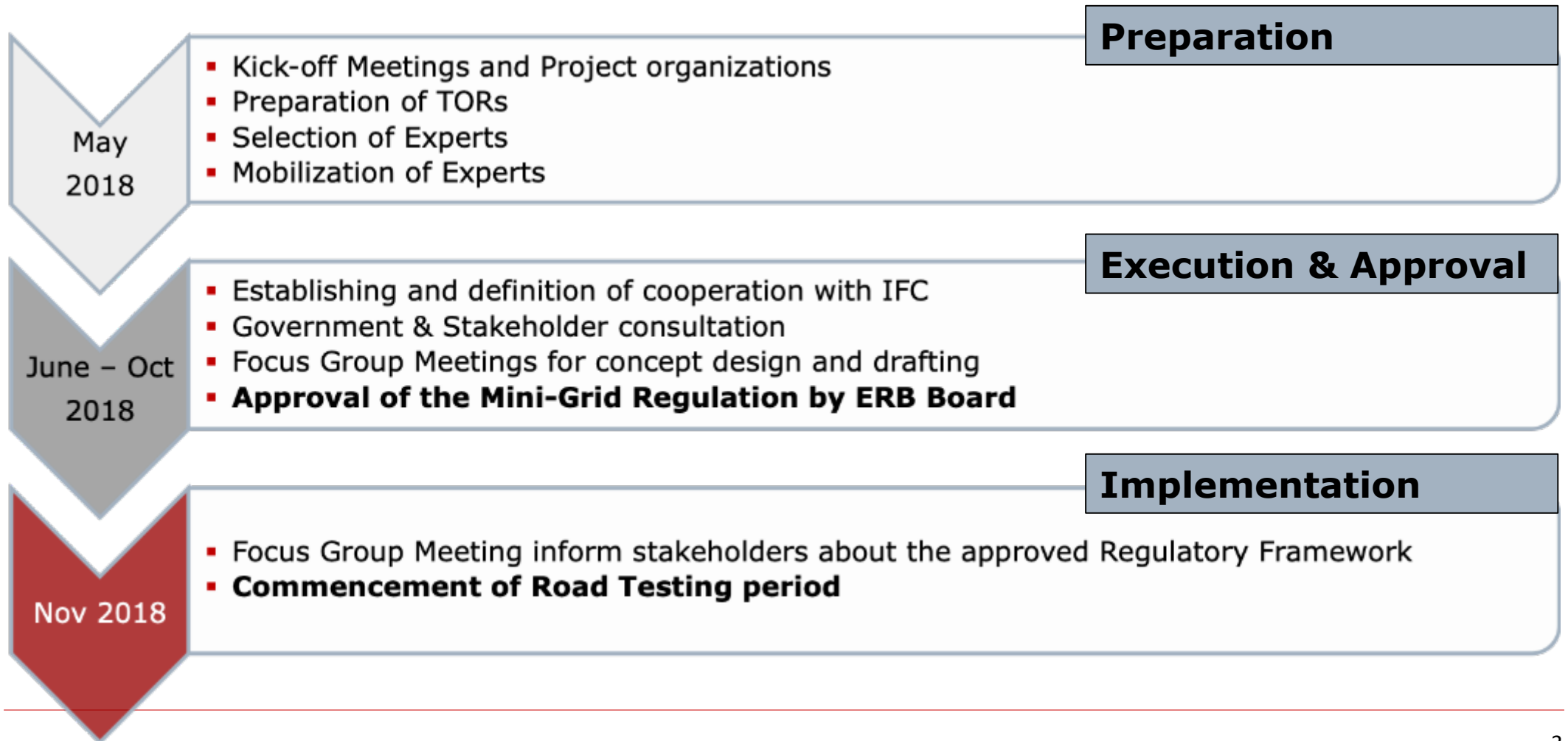
ERB Mini-grid Regulations Background

- Government of the Republic of Zambia (**GRZ**) with the support of the European Union (**EU**) is implementing an “Increased Access to Electricity and Renewable Energy Production” project (**IAEREP**).



ERB Mini-grid Regulations

Path to ERB Board Approval



ERB Mini-grid Regulations Path to Market

Implementation

Jan – Apr
2019

- Refinement of licensing, tariffs and technical regulations
- Publication of approved Mini-grid Regulations on ERB website
- Commencement of Capacity Building

Road Testing

May 2019
and
onwards

- Call for proposal (CFP) for Demo projects by REA
- Other solicited and unsolicited projects
- Incorporation of lessons learned during road-testing
- **Determination of regulatory parameters for tariff application**

Consultation

Oct
22 2019

- **Publication grid encroachment/licensing regulations**
- Workshop to inform public of all updated regulations (including tariff parameters) post road-testing comments
- Incorporation of comments received from publication & workshop

Gazetting

Nov 2019
and
onwards

- Submission of all updated regulations to ERB
- Submission to Ministry for publication in the *Gazette*
- Interaction with Attorney General and Business Review Regulatory Agency (RIA)

ERB Mini-grid Regulations Highlights

Regulation	Key	Principles
Legal	Licences with defined geographical areas and licence conditions based on installed capacity	<ul style="list-style-type: none"> ▪ Very Light handed regulated licence (≤ 100 kW) ▪ Light handed regulated licence (between 100 kW and 1,000 kW) ▪ Fully regulated licence ($> 1,000$ kW)
Licensing	Application, consideration and award of licences	<ul style="list-style-type: none"> ▪ Use it or lose it principle ▪ Exclusivity of supply ▪ Combined generation, distribution and supply licence
Grid Encroachment	Willing Buyer / Willing Seller	<ul style="list-style-type: none"> ▪ 7 different cooperation models ▪ Compensation as result of negotiations ▪ Expert determination if no agreement is reached
Technical	Technology agnostic approach to requirements	<ul style="list-style-type: none"> ▪ All Renewable Energy sources (e.g. Hydro, PV, Wind, Bio) ▪ Technical requirements depend on installed generation capacity ▪ All technologies (AC and DC)
Tariff	Cost Reflective Tariffs	<ul style="list-style-type: none"> ▪ Submission of applied tariffs to ERB (≤ 100 kW) ▪ Light-handed regulated tariffs (between 100 kW and 1,000 kW) ▪ Fully regulated tariffs ($> 1,000$ kW)

ERB Mini-grid Regulations

To whom they apply

Existing Mini-grid

New Mini-grid

(REA CfP & Other solicited and unsolicited projects)

For any projects in rural and urban areas

Legal:

- No change to existing license and licence conditions

Legal:

- New license and license conditions apply
- New licensing procedures apply post *Gazetting*

Grid Encroachment:

- No protection until regulations *Gazetted*

Grid Encroachment:

- Grid encroachment regulations apply after *Gazetting*

Technical:

- Upgrade options provided in the approved technical requirements

Technical:

- Comply with approved technical requirements

Tariffs:

- No change to approved tariffs

Tariffs:

- Comply to tariff regime as applicable to a category

ERB Mini-grid Regulations Segmentation

Categories & Cluster




Capacity	≤ 100 kW	100 kW – 1,000 kW	$> 1,000$ kW
Legal / Tariff	Cat I	Cat II	Cat III
Capacity	kW ≤ 10	$10 < \text{kW} \leq 100$	> 100 kW
Technical	Cluster 1 - Hydro		
	Cluster 3 – PV, Wind, Bio etc.	Cluster 2 – PV, Wind, Bio etc.	Cluster 2 – PV, Wind, Bio, etc.

Categories (Cat I, II, III) = Segmentation by installed capacity

Cluster (Cluster 1,2,3) = Segmentation by installed capacity and technology

ERB Mini-grid Regulations

Legal: Insights to License

Category / Capacity	License	Principles
 ≤ 100 kW	Very Light handed	<ul style="list-style-type: none"> Fixed term, predetermined geographical area Developer chooses tariff/usage charge design, ERB may intervene if tariffs too high
 100 – 1,000 kW	Light handed	<ul style="list-style-type: none"> Fixed term, predetermined geographical area Pre-approved tariffs – developer provide 5-year tariff levels and escalation rates ERB uses an in-house modelling tool to check the alignment of the tariff request
 > 1,000 kW	Fully regulated	<ul style="list-style-type: none"> Fixed term, predetermined geographical area Normal tariff approval and review process - tariffs regulated in 5-year regulatory periods; tariffs adjusted every year

ERB Mini-grid Regulations

Grid Encroachment

Principles

Business Models

1

- Security of tenure (licence validity for area/term of license)

2

- Exclusivity of mini-grid supply area linked to term of licence
- Use-it or lose it principle if rights not exercised in accordance with business plan/licence

3

- Applicable technical requirements depend of cooperation model
- 7 different cooperation models allowed by ERB

4

- Willing Buyer / Willing Seller transaction
- ERB involvement to ensure customer benefits (expert determination)
- Financial compensation depends on business model

ERB Mini-grid Regulations

Technical: Insights to Clusters

Cluster / Technology	Capacity	Design	Main Grid Readiness	ERB Distribution Grid Code
1 Hydro	Any	AC - 3phase	With Commissioning	In case MV voltage distribution is part of the Mini-grid, ERB Distribution Grid Codes apply
	2 2.1 PV, Wind, Bio, ...			
2.2 10 < kW ≤ 100				
3 PV, Wind, Bio, ...	3.1 2 < kW ≤ 10	AC – 1 phase DC (48/72V)	None	
	3.2 ≤ 2 kW	AC – 1 phase DC (24V)		

ERB Mini-grid Regulations

Technical: Broad Requirements



1. Planning a Mini-grid

2. Environmental Assessment

3. Construction

4. Generation and Storage

5. Distribution of Energy

6. Consumer Connection and wiring

7. Metering




8. Health, Safety, Environment

9. Asset Protection

10. Performance Reporting

ERB Mini-grid Regulations

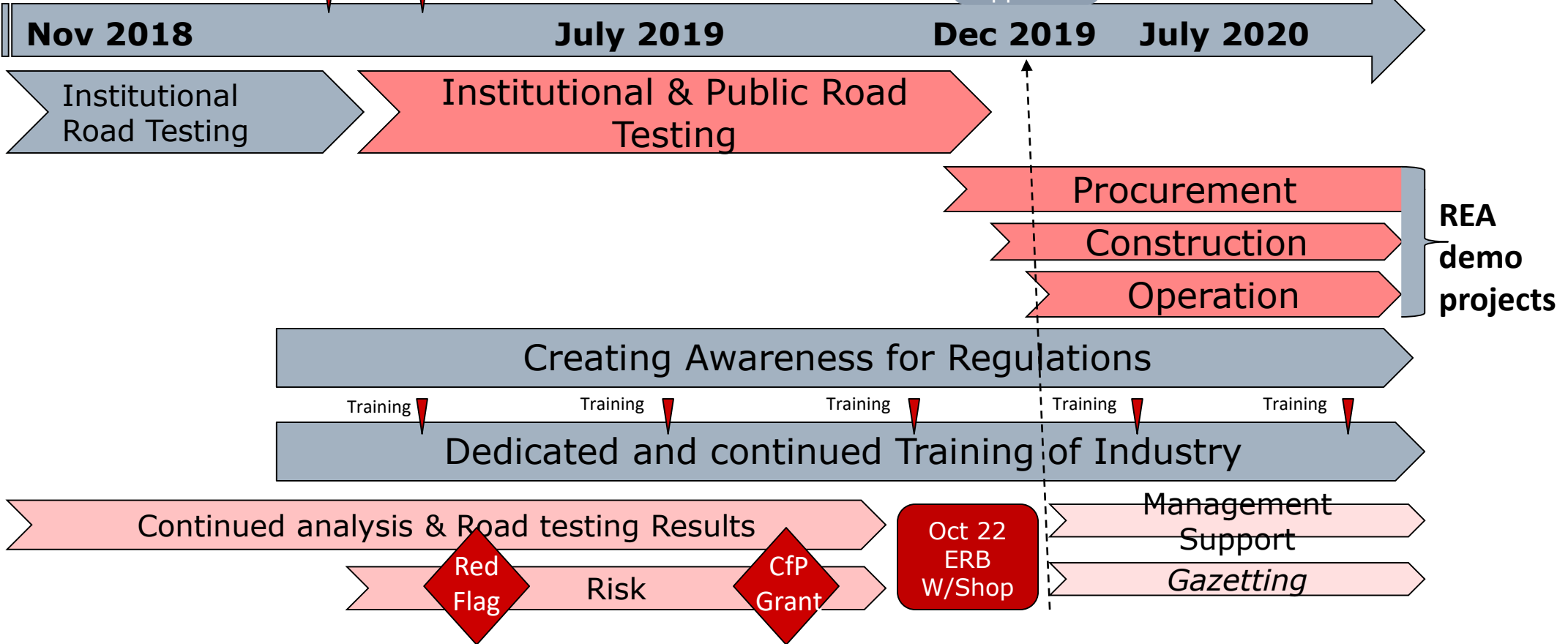
Tariff: Insights

Category / Capacity	Tariff	Principles
 <p>≤ 100 kW</p>	<p>Very light handed</p>	<ul style="list-style-type: none"> Mini-Grid free to apply tariffs after submission of data and data is deemed by ERB to be compliant with the requirements under the tariff rules. ERB may intervene if tariffs are excessive. Developer must show to ERB tariffs adjusted to reflect subsidy Developer chooses tariff/usage charge design
 <p>100 – 1.000 kW</p>	<p>Light handed</p>	<ul style="list-style-type: none"> Up-front tariff approval Developers are asked to provide 5-year tariff levels and escalation rates ERB uses an in-house modelling tool to check the reasonableness of tariff request Tariffs stay fixed in real terms for 5 years, subject to a change which breaches. “materiality threshold” ERB may trigger a detailed tariff review for unreasonable Category II Mini-Grids tariffs. Developer chooses tariff/usage charge design
 <p>> 1.000 kW</p>	<p>Regulated</p>	<ul style="list-style-type: none"> Tariffs regulated in 5-year regulatory periods during Periodic Reviews. Tariffs adjusted every year for cost true-up and indexation Allowed costs calculated according to the building-block approach Interim ERB approves “regulatory parameters” at beginning of each period Review can be triggered depending on a “Materiality threshold” Developer chooses tariff/usage charge design

ERB Mini-grid Regulations Road Testing of Regulations

ERB Workshop
CfP 8/5/2019

ERB Board Approval



ERB Mini-grid Regulations Regulatory Work in 2019

Regulation	Regulatory Work in Progress
Legal	<ul style="list-style-type: none"> ▪ Grid encroachment regulations ▪ Licensing regulations ▪ Updated mini-grid generation, distribution and supply licence
Grid Encroachment	<ul style="list-style-type: none"> ▪ Approved principles and provisions from legal and technical framework transferred to a stand-alone regulation dealing specifically with grid encroachment
Technical	<ul style="list-style-type: none"> ▪ Alignment with ZEMA for environmental assessment ▪ ZABS work on Technical Standards for Mini-grids ▪ Updated Technical Standards Regulation
Tariff	<ul style="list-style-type: none"> ▪ ERB inhouse tariff evaluation tool ▪ Setting regulatory parameters for application of tariffs ▪ Updated Tariff Rules

ERB Mini-grid Regulations

Mini-grids in Zambia

S/No.	Technology	Category	Number of Mini-grids
1	Solar PV	Very light handed (Cat 1)	7
2	Hydro	Light handed (Cat 2)	1
3	Hydro	Fully regulated (Cat 3)	1

Further information

☐ **ERB Website:**

<http://www.erb.org.zm/content.php?viewpage=mini>

☐ **Off-grid Web Portal**

<http://www.offgrid.gov.zm>

☐ **ERB Contact Person:**

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☐ **Formal comments to the ERB:**

The Executive Director, ERB, erb@erb.org.zm

**Please Diarise the 22nd of October
2019 for
Mini-grid Regulations Workshop**

Venue will be made known in due course

THANK YOU FOR YOUR ATTENTION

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