

TECHNICAL REQUIREMENTS OF MINI-GRIDS IN CAMEROON

PRESENTATION OF CAMEROON TO THE STEERING COMMITTEE OF THE AFUR PROJECT ON
**" THE INTEGRATION OF MINI-GRID TARIFF REGULATION TOOLS AND METHODOLOGY IN AFRICAN
REGULATORY AGENCIES »**

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Introduction

Law No. 2011/022 of December 14, 2011 was drafted to thoroughly reform Law No. 1998/022 of December 24, 1998 governing the electricity sector, which had many limitations in the valuation of the establishment mini-grids, with a view to its modernization and development.

Law No. 2013/004 of April 18, 2013 sets the incentives for private investment in the Republic of Cameroon through which the Cameroonian Government has set the tax and customs exemptions.

The objectives of this reform are:

- disengage the State in the commercial electricity service;
- reduce the financial weight of the sector on the State budget;
- improve the contribution of the electricity sector in the economy and in the social development of the country;
- increase the rate of access to electricity in Cameroon;
- Promoting renewable energies (EnR):
 - Characterization of renewable energies (solar, wind, small hydro, biomass, geothermal, and energies of marine origin)
 - Exemption from taxes on equipment for renewable energy installations ;
 - the obligation of connection to the network of any producer of electricity from renewable energies who requests it.

Cameroonian regulations on mini-grids

- The 2011 Law deals with **rural electrification** (by extension of the network or by **decentralized production**). It only mentions **decentralized rural electrification** once to highlight the constraints
- The 2011 Law defines **decentralized production** as " an electricity production unit intended to meet the electricity needs of users located far from interconnected networks and unable to connect to them in the medium term " (*see Article 5 on definitions*)
- This provision reflects the government's strategy which envisages that the electrification of the country should be carried out as a priority by extending the interconnected networks. Mini-grids therefore appear as temporary solutions.

Cameroonian regulations on mini-grids

1998 Act

- Authorization scheme for distributions of less than 100 kW
- Absence of specific rural electrification financing mechanism

2011 Act

- Creation of an Electricity Sector Development Fund
- Rural electrification/decentralized generation
- the obligation to connect any producer on the basis of renewable energies to the network for the sale of surplus production
- tax and customs benefits for products, goods and services intended for the exploitation of renewable energies
- Cost-of-service pricing

2013 Act

Tax and customs exemptions on equipment for renewable energy installations

Technical requirements

- In relation to interconnected networks
 - Article 5 of the 2011 law, in the definition of decentralized generation, indicates the priority given to electrification by extension of the interconnected networks.
 - The technical requirements specific to mini-grids, related to the equipment used during the various stages of the project, to the interconnection directives, to the quality, availability and reliability of the electrical energy produced, are not defined in the framework regulatory.
 - The concessionaire of the public electricity service, which has several mini-distribution networks in its concession, has only one normative and technical reference for their construction and operation
 - In practice, networks made by third parties require upgrading to comply with the technical specifications of interconnected networks.
- In relation to decentralized production
 - Article 59 of the 2011 law provides that in the context of decentralized rural electrification, and taking into account the constraints linked to the protection of the environment, priority is given to decentralized production from energy sources. renewable, except in case of deficiency, prohibitive costs or insufficiency thereof;
 - A hybridization program for thermal power plants isolated from the incumbent operator's concession is underway to meet this requirement;
 - However, in the context of a connection to the Public Distribution Network (RPD), a connection agreement between the producer and the RPD Concessionaire will be drawn up, based on the technical requirements of the RPD;

Impact of technical requirements on prices

- General framework
 - The electricity tariff is calculated on the basis of the cost of service including that of the mini-grids
 - Within the framework of the public service, the profitability of the investments is guaranteed.
 - Tariffs must allow mini-grids to recover their costs (investment, operation, maintenance) and generate a return assessed on the basis of the weighted average cost of capital.
- Case of mini-grids
 - Do not benefit from the scale effects of the national transmission network and the national distribution network;
 - The construction and operation of mini-grids do not benefit from specific technical and economic standards;
 - Projects based on decentralized production from renewable energies benefit from tax relaxations.
- Impact on the mini-grid tariff
 - The unit energy costs of mini-grids is structurally higher than that of interconnections;
 - Tax relief for renewable energy generation cannot compensate for the costs generated in mini-grids. However, they help to mitigate the effects of thermal generation on costs and environmental impacts.

Tariff of mini-grids in Cameroon

Mini-grid	Technical requirements	Rate charged	Comments
02 hybrid power plants (solar + thermal) in Djoum in southern Cameroon and in Lomié in eastern Cameroon	Distribution network type	DSO tariff	<ul style="list-style-type: none"> Plants operated by ENEO Tariff equalization
27 isolated thermal power stations			
Decentralized electrification of 1,000 localities by photovoltaic solar system throughout the country with a total capacity of 11.2 MW. Currently 350 localities are already electrified	Mini-grid type	CFAF 100/kWh	This is a rate that is not based on the cost of service
Mini hydroelectric power station of Mbakaou Carrière with a capacity of 1.4 MW	Distribution network type	CFAF 165/kWh	

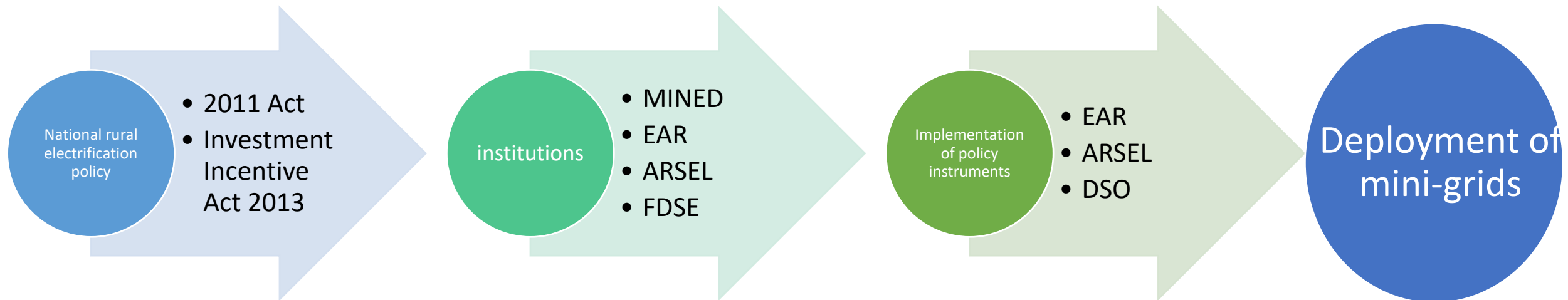
GRD: the Distribution Network Manager in Cameroon is ENEO

DSO tariffs (ENEEO)

Low tension	Less than or equal to 110 kWh	Between 111 kWh and 400 kWh	Between 401 and 800 kWh	Above 800 kWh
Residential uses	CFAF 50/kWh	CFAF 79/kWh	CFAF 94/kWh	CFAF 99/kWh
Non-residential uses	CFAF 84/kWh	CFAF 92/kWh	CFAF 99/kWh	

Medium voltage	From 0 to 200 h	From 201 to 400 h	Over 400 hours
Between 11 p.m. and 6 p.m.	CFAF 70/kWh	CFAF 65/kWh	CFAF 60/kWh
Between 6 p.m. and 11 p.m.	CFAF 85/kWh	85 FCFA/kWh	85 FCFA/kWh

Process of setting up technical aspects in the regulation of mini-grids in Cameroon



Process for setting up the normative and regulatory framework for mini-grids

- Assessment of the existing
 - The law mentions but does not deal specifically with decentralized electrification
 - The law favors electrification by extension of interconnected networks
 - The law and government policy place great emphasis on the development of renewable energy for power generation
 - Cameroon has not adopted any specific standard on mini-grids and it has no related regulations.
 - The development of mini-grids is done according to the specifications of their promoters (Eneo and Huawei for example)
 - This results in a high cost for the economy, in particular to ensure the compatibility of the networks
- Approach to consider
 - Define the government vision on the development of mini-grids including the technical, legal and economic conditions for their integration into public distribution networks
 - Develop the texts that materialize the said vision
 - Adopt the standards and technical specifications corresponding to the government vision
 - Adopt regulations making standards and technical specifications mandatory
 - Promote ARSEL's participation in the steering committee of the project on "the integration of tools and methodologies for the tariff regulation of mini-grids in African regulatory bodies" for the definition of a specific regulatory and tariff framework

Conclusion

- The large number of localities not electrified and far from the network makes the development of mini-grids a real opportunity for Cameroon
- The absence of a normative and regulatory framework generates a sub-optimal development of this development tool in Cameroon
- The provisions of the 2011 law on renewable energies, rural electrification and energy efficiency constitute assets likely to facilitate the definition of a vision of mini-grids
- The adoption of standards and regulations making them mandatory is of great importance
- The enhancement of ARSEL's participation in AFUR's work would ensure better profitability for mini-grids

**THANK YOU FOR YOUR
ATTENTION**