

**AUTORIDADE REGIONAL
REGULADORA DE ELETRICIDADE DA CEDEAO**

**ECOWAS REGIONAL
ELECTRICITY
REGULATORY AUTHORITY**



**AUTORITÉ DE RÉGULATION
RÉGIONALE DU SECTEUR DE
L'ÉLECTRICITÉ DE LA CEDEAO**

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INSTRUCTIONS FOR FORM ERERA-101

The Form ERERA-101 is designed to allow ERERA to feed its database on the electricity sector of ECOWAS Member States with necessary information for completion of its mission, as defined by Rule C/REG.27/12/07..

The **2014 version of the form ERERA-101** is prepared to collect the raw data of the year 2013. It includes four Schedules and a sheet for the collection of historical data from 2008 to 2012

SCHEDULE 1. IDENTIFICATION

1. Data Contributor Contact: Give name, title, email address, telephone number, fax number of the person who fill the form.
2. Supervisor of Data Contributor Contact: Give Data Contributor supervisor's name, title, address, telephone number, fax number and email address. Supervisor contact must be different than the Data Contributor Contact.
3. Contributor's entity Information: Give the legal Name of the Contributor's Entity.
4. Current Address of the Entity's Headquarters: Enter the complete address, of the headquarters of the Contributor's Entity .

SCHEDULE 2. GENERAL INFORMATION

1. For line 1, Give the Number of Operators in the Generation Field in your Country. This number does not include a self-generator which is a customer who generates electricity using equipment he owns and operates to meet part or all of his energy needs.
2. For line 2, Give the legal name of the operators in the Generation Field. If the number given in line 1 is greater than 6, give the first six operators in a ranking according to their available installed capacity.
3. For line 3, Give the Number of Operators in the Transmission Field in your Country.
4. For line 4, Give the legal name of the operators in the Transmission Field. If the number given in line 3 is greater than 4, give the first four operators in a ranking according to their available wheeling capacity.

5. For line 5, Give the Number of Operators in the Distribution Field in your Country.
6. For line 6, Give the legal name of the operators in the Distribution Field. If the number given in line 5 is greater than 8, give the first eight operators in a ranking according to their distribution capacity.
7. For line 7 on sector Activities, Check the appropriate activities your Country was engaged in during the reporting year.
 - **Generation by Utility (ies) :** Check this activity if one or more utilities operate in generation field during the reporting year.
 - **Transmission:** Check this activity if there is an activity of transmission during the reporting year. As example transmission is considered as wheeling of electricity at a voltage greater than 50 kV.
 - **Independent Power Producer (IPP) :** Check this activity if, during the reporting year, there is one or more companies (independent power producer) that uses their own equipment to produce electricity for the purpose of selling it.
 - **Distribution using owned/leased electrical network :** Check this activity if there is one or more operators in the distribution field during the reporting year
 - **Importation of power :** Check this activity if your Country (include any utility, industry or operator) import electricity for the use of ultimate consumers in the country.
 - **Vertically integrated operation of generation, Transmission and distribution:** Check this activity if during the reporting year one utility (or operator) integrate the function of generation, transmission and distribution in a single legal entity.
 - **Dispersed Generation and isolated network:** Check this activity if there is generations that are not connected to the general grid but supply isolated networks.
 - **Wholesale power marketing:** Check this activity if there is end users that are supply directly from the high-voltage system without passing through the distribution system or directly by a Generator.
 - **Retail power marketing separated from distribution:** Check this activity if the distribution operator is legally different from the retailers of the electricity.
 - **Multisectorial Utility Services (electricity plus other services such as gas, water, etc. in addition to electric services):** Check this activity if the utility providing the electricity services has in his portfolio other utility services as water and gas.
 - **Exportation of power :** Check this activity if your Country (include any utility or operator) export electricity.
 - **Separated account in operation of generation, Transmission and distribution :** Check this activity if there is a separate cost account in the pricing structure of the three fields generation, transmission, distribution even if two or all of the three fields are integrated in a

unique utility.

8. For line 8, Give the total installed capacity of the Country. Differentiate the installed capacity of purely national infrastructures from the international infrastructure as those of OMVS, OMVG, CEB etc.
9. For line 9, Give the Highest Total Peak Load of the year. If such data is not available because of isolated networks, give the estimation of the appropriate integration of the peak Load of all the networks. The total value in Megawatt is rounded to the nearest 0.1. (A Total Peak Load of 1,348,597 kW will be 1,348.6 MW)
10. For line 10, Give the Total Consumption of your Country. It is the total amount of electricity consumed by all ultimate customers (end users) both from the wholesale and from the retail market. This is the total amount of national consumption measured both billed as unbilled.
11. For line 11, Give the Total Sales of your Country. This is the total amount of electricity sold at exportation and to all ultimate customers.

SCHEDULE 3. SUPPLY BY SOURCES AND DISPOSITION

This schedule reports information on known sources of power supply of the system and its disposition. The breakdown of sources is by origin of the primary source used for the power production. It includes national and "international" infrastructures respectively in column (a) and (b). The infrastructures called « international » are those like OMVS, OMVG, CEB who are under international agreements for their assets.

1. For each of the sources listed in columns (a) and (b), provide in lines 1 through 8, the installed capacity in MW rounded to the nearest tenth. In line 9 compute the Total of line 1 through 8 for each column (a) and (b). The installed capacity is the sum of the nominal capacities that the generators of a power plant can deliver in output. In the particular case of a multi-fuel fired power plant, provide the installed capacity for the main fuel only. The data of net generation in MWh (line 11-19) will highlight this feature.
2. For each of the sources listed in columns (a) and (b), provide in lines 11 through 18, the total net generation in megawatt hour. In line 19 compute the Total of line 11 through 18 for each column (a) and (b).
3. Provide in line 21 for each column (a) and (b) eventually, the total power import in MWh. The energy imported represents energy purchased or exchanged from abroad for consumption within your Country system.
4. Provide in line 22 for each column (a) and (b) eventually, the total power export in MWh.
5. Provide for line 23 for each column (a) and (b) eventually, the total

Wheeled Received in MWh. The Wheeled Received is the total amount of energy entering the system of your Country from other Country for transmission through your Country (wheeling) for delivery to a third Country. The energy imported is not report as Wheeled Received.

6. Provide for line 24 for each column (a) and (b) eventually, the total Wheeled Delivered which is the actual total amount of energy leaving the system of your Country to another Country in case of a wheeling operation. The energy exported is not report as Wheeled Delivered. If the Wheeling Delivered is not precisely known, please estimate based on your system's known percentage of losses for wheeling transactions.
7. Provide for line 25 for each column (a) and (b) eventually, the Wheeling Losses which represents the energy losses on your system associated with the wheeling of energy for other Countries. It is normally Line 23 minus line 24. In case the Wheeling Delivered is not precisely known, the system's known losses for wheeling transactions are estimated.
8. Provide for line 31 for each column (a) and (b) eventually, the total Consumption of Ultimate Consumers. The ultimate consumers represent all the costumers purchasing electricity for their own use and not for resale.
9. For Line 32, Provide the number of customers involved in the consumption of Line 31. A customer is defined as a metered electrical service point for which an active bill account is established at a specific location.
10. For line 41, Total Transmission Losses, enter the total amount of electricity lost from transmission system in MWh.
11. For line 42, Total Transmission Losses, enter the percentage (%) of electricity lost from transmission system.
12. For line 43, Total Distribution Losses, enter the total amount of electricity lost from Distribution system in MWh.
13. For line 44, Total Distribution Losses, enter the percentage (%) of electricity lost from Distribution system.
14. For line 45, Total System Losses, enter the total amount of electricity lost from all the electric system (included transmission, distribution, and/or unaccounted for). This is the difference between the sum of Line 19, Line 21 and Line 23 and the sum of Line 22, Line 24 and Line 31. The Total System Losses should always be expressed as a positive value.
15. For line 46, Total System Losses, enter the percentage (%) of electricity lost from all the electric system (included transmission, distribution, and/or unaccounted for). This is the value of Line 45 expressed as a percentage of the sum of Line 19, Line 21 and Line 23.

SCHEDULE 4. DISTRIBUTION SYSTEM RELIABILITY DATA

The schedule 4 collects the System Average Interruption Frequency Index or SAIFI and the System Average Interruption Duration Index or SAIDI statistics. As prescribed by the AFUR Common Guidelines for Quality of service, AFUR Member computes the SAIFI and SAIDI indexes and determines Major Event Days using the IEEE method (IEEE Standard 1366-2003: IEEE Guide for Electric Power Distribution Reliability Indices). According to the IEEE method the momentary interruption (interruption less than 5 minutes) are not included in determining SAIDI and SAIFI. Only sustained interruptions are included (more than 5 minutes). The purpose is to determine for distribution system, the average number and the duration of supply interruptions per customer arising from loss of supply.

Two level of details are considered in the calculations of these indices :

- (i) Include and exclude major events in the calculations. Major events are exceptional circumstances (such as hurricane, flood ...) that cause outage.
- (ii) Include and exclude interruptions caused by a failure in the transmission system, including the transmission portion of the substation, or loss of a generation source. This will permit to differentiate the interruption due to distribution system incidents from loss of supply due to load shedding or transmission incidents.

1. The system average interruption frequency index, or SAIFI, indicates how often the average customer experiences a sustained interruption (of over 5 minutes) over the year. In this schedule the SAIFI resulting from all interruptions in the reporting year is calculated as the sum over the year of customers interrupted for each sustained interruption during year, divided by the total number of customers.

$$\text{SAIFI} = \frac{\text{[Sum of total number of customers interrupted over the year]}}{\text{[Total number of customers served]}}$$

2. The system average interruption duration index, or SAIDI, indicates the total duration of interruption for the average customer over the year. In this schedule report, the SAIDI resulting from all interruptions in the reporting year is calculated as the sum over the year of all customers interrupted for more than 5 minutes times the number of minutes they experienced an interruption, divided by total number of customers.

$$\text{SAIDI} = \frac{\text{[Sum of customer minutes interrupted over the year]}}{\text{[Total number of customers served]}}$$

3. On line 6, enter the Total number of customers used to calculate SAIDI and SAIFI, as reported on this schedule. A customer is defined as a metered electrical service point for which an active bill account is established at a specific location (e.g., premise). (IEEE 1366-2003 pg 2)
4. On line 7, indicate the highest voltage that is considered in your Country as part of the distribution system, as opposed to the supply system.

5. On line 8, indicate whether there is an automatic outage management system to detects loss of load or customer outages (answer yes « Y » or no « N »)
6. On line 9, indicate how the momentary outages are defined. Less than how many minutes.