

**PUBLIC UTILITIES  
REGULATORY COMMISSION**



# **REGULATORY BRIEF**

**ISSUE 6**

**Electricity Tariff Setting Methodology  
and Tariff Structure in Ghana**

Task 2 – Comparative Analysis  
of DisCos Performance

AUGUST 2023

## KEY HIGHLIGHTS

- The analysis serves as an initial picture of the operational performance of ECG and NEDCo, giving grounds for a detailed assessment of the business plan and projections included in the 2022 major tariff petitions
- Europe's average time a customer is disconnected for maintenance purposes, is extremely low, because networks are redundant and live maintenance is generally performed.
- The losses performance of ECG and NEDCO requires high attention, particularly when compared with the achievements obtained in relation with the quality of service.
- Companies can increase their overall efficiency by adopting best practices of the top-ranking companies, who with relatively reduced staff, rely on specialized outsourced services to carry out much of the ground activities (maintenance)

## 1.0 Introduction to Comparative Analysis

The Public Utilities Regulatory Commission (PURC), within its regulatory mandate, has two windows for tariff considerations; the Major Tariff Review and Quarterly Tariff Reviews. The major tariff review process often considers the various investments undertaken by utilities with respect to their infrastructure. This window considers both capital expenses (CAPEX) as well as Operational expenses (OPEX) of the Utilities. To commence a major tariff review, the Commission invites tariff proposals from the regulated Utilities. These proposals detail out the utility's investments and its plans for improved service delivery in the future. The latest of this exercise was undertaken in 2022, and will span the period 2022-2025. This is known as the Multi Year Tariff Review. Subsequently, quarterly reviews are done, with the major tariff serving as a base. This exercise enables the real value of the tariff to be maintained thereby keeping the utilities financially viable.

This Brief is synthesized from the Task 2 - Comparative Analysis of DisCos' Performance Report prepared by the MRC Group for the World Bank. The purpose of the analysis is to

provide PURC, quantitative elements to help discuss and assess the Commission's regulated distribution Companies (DisCos') tariff proposals along with the review process. The analysis considered information included in the 2022 tariff proposals of the Electricity Company of Ghana (ECG) and Northern Electricity Distribution Company (NEDCo), while cross-checking with information in the MRC data base, which includes unbundled electricity distribution companies in Latin America, Middle East and North Africa (MENA) and Sub-Sahara Africa (SSA) regions. No independent verification of the data used for the analysis has been conducted by the Commission.

## 2.0 Distribution Companies' Technical Performance

### 2.1 Quality of Service

In assessing the quality of service, the SAIDI and SAIFI were among the indicators used to measure overall quality of service (reliability), and they are reported by the two distribution companies in Ghana annually.

Table 1: SAIDI and SAIFI evolution during the last 4 years

| CATEGORY |       | SAIDI  |       |       |       | SAIFI  |       |       |       |
|----------|-------|--------|-------|-------|-------|--------|-------|-------|-------|
| ECG      |       | 2018   | 2019  | 2020  | 2021  | 2018   | 2019  | 2020  | 2021  |
|          | Metro | 55.93  | 36.9  | 21.95 | 26.63 | 36.28  | 24.99 | 15.36 | 17.8  |
|          | Urban | 90.53  | 61.99 | 42.92 | 52.43 | 72.99  | 47.06 | 26.45 | 27.69 |
|          | Rural | 100.62 | 79.29 | 51.81 | 56.29 | 100.62 | 79.29 | 51.81 | 56.29 |
| NEDCo    | Total | 115.4  | 60.1  | 59.4  | 63.6  | 77.9   | 48.8  | 69.1  | 40.9  |

Source: The World Bank Report, 2022

Table 1 above shows a general downward trend in ECG's (Metro, Urban, Rural) and NEDCo's key performance indicators for SAIDI and SAIFI. Comparing the performance with countries from Asia, Latin America and MENA, the Ghanaian companies are positioned in the lower performance bracket with the best performing indicator being ECG's Metro. Whereas, SAIDI of companies such as Middle Egypt, North Cairo, Meralco of Philippines and EE Quito of Ecuador was below 5-hours/customer/year in 2021, ECG's metro, the best performing for Ghana was around 26.63-hours/customer/year. Similarly, on SAIFI, the best performing companies in the sample; Upper Egypt, Meralco of Philippines, North Cairo and Saudi Arabia and EE Quito of Ecuador recorded less than 10 interruptions/customer/year, while ECG's Metro, the best performing in Ghana recorded 17.8 interruptions/customer/year in 2021.

## 2.2 Network Losses

Generally, companies in Europe and Latin American countries, presented lower losses than the rest of the companies in the sample. Turkish companies, for instance, have relatively lower loss levels, reflecting the efforts made by these companies, supported by the regulator, in controlling technical losses and reducing commercial ones. The analysis shows that distribution companies in Ghana performed poorly (ECG-29.84%; NEDCo-27.29%) and ranked low in the bottom of the comparison table, performing worse than other African companies in the selected group: ESKOM (South Africa) at 10% of distributed energy, EMEME (Uganda) at 17% of distributed energy and KPLC (Kenya) at 21% of distributed energy.

Table 2: Distribution Losses 2021

| CATEGORY |             | SAIDI           |                     |
|----------|-------------|-----------------|---------------------|
|          | Total Loses | Technical Loses | Non-technical Loses |
| ECG      | 29.84%      | 10.55%          | 19.29%              |
| NEDCo    | 27.29%      | 9.20%           | 18.09%              |

Source: The World Bank Report, 2022

## 3.0 Distribution Companies' Operational Performance

The operational performance of power utilities is related to the way utilities organize their internal activities in the most efficient way, in an attempt

to reach highest levels of productive efficiency. Three variables were considered in this analysis, namely, the DisCos sales energy, which indicates the higher the energy distributed, the higher the administrative and managerial requirements; the total number of customers served, which determines efforts in metering, billing, and collection and lastly, length of the distribution network.

### 3.1 Labour Productivity

Three different ratios were used to compare the degree of labour productivity including network length per employee, customers per employee and energy distributed per employee.

Table 3: ECG and NEDCo Data

| 2021         | ENERGY DISTRIBUTED (GWH) | CUSTOMERS (#)    | NETWORK LENGTH (KMS) | EMPLOYEES    |
|--------------|--------------------------|------------------|----------------------|--------------|
| <b>ECG</b>   | <b>9,978</b>             | <b>4,290,148</b> | <b>18,446</b>        | <b>6,383</b> |
| <b>NEDCO</b> | 1,060                    | 1,136,050        | 41,623.3             | 3,000        |

Source: ECG data base and NEDCo 'TARIFF PROPOSAL FOR 2022 as seen in the World Bank Report

The World Bank Report suggests that companies in Ghana are in the bottom range of labour productivity when compared with their selected peers, notwithstanding the indicator used to measure the "size" of the Disco. Taking the indicator of employees/km of network, probably the most relevant for maintenance and operation, it was observed that, the most efficient DisCo, NEDCo, has approximately one employee/14km of network, while Meram, Enerjisa or Ye ilimark in Turkey have slightly less, that is, one third of the staff per km of network. Companies that ranked high (Enel Perú; Enel Chile or Ye ilimark in Turkey) increased their overall efficiency by operating and maintaining distribution networks with relatively reduced staff, who are highly qualified and trained, and relying on specialized outsourced services to carry out much of the ground activities (i.e., maintenance).

### 3.2 OPEX Performance

The World Bank Report considers using only headcount as an indicator of determining efficiency. This is misleading, given that operational and maintenance activities of some companies are developed either by using own personnel or subcontracting such activities. Thus, Total OPEX was used as the monitoring variable.

In an analysis such as this, one key challenge observed was the issue of different local currencies when conducting comparison on total OPEX among companies in different countries. However, these costs were converted using the Power Purchase Parity (PPP), which is calculated by the World Bank to reflect the purchase power of the

local currency. This reflects better the local economic conditions. Given that, a large portion of the OPEX for a distribution company is spent locally, this is considered as the more appropriate rate to make for comparative analysis. The analysis indicates that, notwithstanding which indicator is used, ECG appears to be in the top range of the sample with highest unit costs. NEDCO on the other hand, is positioned in the lower half range when considering OPEX per network length or OPEX per customer.

## 4.0 Conclusion and Recommendations

The analysis by the World Bank is an initial and short time referential comparison, which according to the report, does not allow for any conclusion per-se on the respective tariff petitions. However, analysis undertaken can serve as an initial picture of the operational performance of ECG and NEDCo, giving grounds for a detailed assessment of the business plan and projections included in the 2022 major tariff proposals.

The report posits that Europe's average time a customer is disconnected for maintenance purposes, is extremely low, because networks are redundant and live maintenance is generally performed. It is therefore recommended that; DisCos in Ghana should vigorously target reducing interruptions due to maintenance activities or load management.

In conclusion, performance levels of ECG and NEDCo in terms of losses, require high attention, particularly when compared with

achievements made in relation to quality-of-service provision. There should be a deliberate effort in controlling technical losses, while eliminating or at best reduce the commercial losses to a barest minimum.

With regards to the indicator of employees/km of network, which is sometimes considered the most relevant for maintenance and operation, NEDCo was Ghana's best performing DisCo, however,

this performance fell short of other DisCos in the survey, recording one employee per 14 km of network. Companies can increase their overall efficiency by adopting best practice of the top-ranking companies, who with relatively reduced staff, highly qualified and trained, rely on specialized outsourced services to carry out much of the ground activities (i.e., maintenance).



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