
**Report of the Commission on the Decision of the Liberia Electricity Corporation Application for Tariff Review**

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**Abbreviations**

| | |
|---|---|
| 2015 ELL | 2015 Electricity Law of Liberia |
| AfDB | Africa Development Bank |
| APR | Administrative Procedure Regulations |
| BoC | Board of Commissioners |
| CAPM | Capital Asset Pricing Model |
| CIE | Cote d' Ivoire Electric Company |
| CLSG | **C**ote d'Ivoire, **L**iberia, **S**ierra Leone, **G**uinea |
| EIB | European Investment Bank |
| ETR | Electricity Tariff Regulations |
| EUTs | End- User Tariffs |
| HFO | Heavy Fuel Oil |
| JEP | Jungle Electricity Power |
| LEC | Liberia Electricity Corporation |
| LERC | Liberia Electricity Regulatory Commission |
| LFO | Light Fuel Oil |
| MW | Mega Watt |
| MYTM | Multi Year Tariff Methodology |
| O&M | Operations & Maintenance Costs |
| OPEX | Operational Costs |
| PPA | Power Purchase Agreement |
| RAB | Regulated Asset Base |
| RR | Revenue Requirement |
| TEC | Totota Electricity Cooperative |
| TSA | Transmission Service Agreement |
| TSO | Transmission System Operator |
| USD | United States Dollar |
| WACC | Weighted Average Cost of Capital |

**Acronyms**

| | |
|---|---|
| **GWh** | Gigawatt-hour |
| **kWh** | kilowatt-hour |
| **MW** | Megawatt |
| **MWh** | Megawatt-hour |

**Foreword**

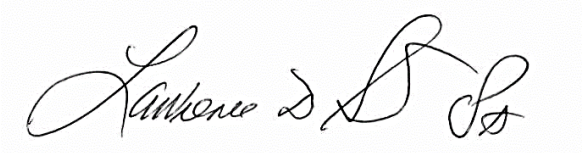
On December 10, 2021, the Liberia Electricity Regulatory Commission (LERC), in fulfilment of its statutory mandate to set and approve tariffs under the 2015 Electricity Law of Liberia (2015 ELL), made and published a decision on the Tariff Application of the Liberia Electricity Corporation (LEC) submitted on June 28, 2021.

This report is issued to satisfy the requirements of Section 13.7(1) (l) of the 2015 ELL, to provide a complete explanation of the reasoning underlying Commission decisions. Furthermore, the report is in line with good regulatory practice and LERC's commitment to ensuring transparency in regulatory decision making.

This report discusses the processes and provides the justification for the newly approved tariffs that became effective in January 2022 and is issued for the benefit of LEC, the Government of Liberia, consumers, and the public, and potential investors.

The Commission would like to acknowledge the contribution of the technical teams of LEC and LERC to the success of the tariff review exercise. This document is the property of LERC which guarantees the accuracy of the information contained herein at the time of the decision.

With the attainment of this milestone, the monitoring of the commercial and technical performance of LEC including the areas of availability of supply and quality of service are now our uppermost priority.



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**CHAIRMAN**
**BOARD OF COMMISSIONERS**

## Executive Summary

The Liberia Electricity Regulatory Commission (LERC), the Commission, was established by the 2015 Electricity Law of Liberia (2015 ELL) to, amongst other things, regulate the electricity supply industry. A fundamental function of the Commission is to set tariffs that allow operators in the industry to stay financially viable while still providing quality, affordable and accessible service to customers at prudent cost. This report presents the tariff-setting exercise and outcome for the LEC tariff period, 2022- 2024.

On December 10, 2021, the Commission rendered its decision on the application for tariff review of Liberia Electricity Corporation (LEC) dated June 28, 2021 relating to its licensed operations. This report is issued in accordance with section 13.7 (1) (l) and (k) of the 2015 ELL which, among others, require the Commission to provide a complete explanation and reasoning underlying its decisions.

In line with the Electricity Tariff Regulations (ETR), LERC requested LEC to submit an application for tariff review for the period 2022-2024. LEC submitted the application covering its operational areas of Montserrado and Margibi Counties. LEC cross-border operations in Nimba county which, is currently under an operatorship contract and Grand Gedeh and Maryland counties which are yet to be contracted out were not considered in this tariff review exercise. The tariff determination process for those distribution areas would be conducted separately.

After receiving the application, the technical teams of LEC and LERC held a series of engagements to ensure the completeness of the application. Subsequently, LERC published the abridged version of LEC complete application for stakeholders' comments. A Public Hearing was conducted on November 12, 2021 at which the stakeholders' comments on the abridged application were obtained. The Commission took these comments into consideration in arriving at the decision on December 10, 2021 which was published in the national gazette and on the LERC website.

The tariff approval process was consistent with the relevant provisions of the 2015 ELL, the ETR and the Multi- Year Tariff Methodology (MYTM). The process for arriving at the end-user tariffs (EUTs) involved the determination of the following:

(i). Revenue Requirement for each activity area;

(ii). Efficient costs for each activity area;

(iii). Least cost production mix from available sources; and

(iv). Tariff structure by customer classes.

The EUTs generated from these exercises are shown in the table below:

**LEC APPROVED END-USER TARIFFS**

| TARIFF CATEGORY | END-USER TARIFF |
|---|---|
| **SOCIAL** | |
| Tariff | US$0.1500/kWh |
| Fixed Charge | N/A* |
| **RESIDENTIAL** | |
| PREPAID | |
| Fixed Charge | US$2.4800/Month |
| Energy Charge | US$0.2400/kWh |
| POSTPAID | |
| Fixed Charge | US$4.4700/Month |
| Energy Charge | US$0.2400/kWh |
| **NON-RESIDENTIAL** | |
| PREPAID | |
| Fixed Charge | US$10.0000/Month |
| Energy Charge | US$0.2200/kWh |
| POSTPAID | |
| Fixed Charge | US$12.0000/Month |
| Energy Charge | US$0.2200/kWh |
| **MEDIUM VOLTAGE** | |
| Fixed Charge | US$50.00/Month |
| Energy Charge | US$0.1900/kWh |

*Source: LERC BoC*

## 1.0 Introduction

This document is a report on the LERC process and basis for the tariffs approved on 10th December 2021 for LEC covering the period 2022 – 2024. It's LERC's first tariff approval after its inception in 2018 and the first time that electricity tariffs are being approved through an independent and comprehensive regulatory process in Liberia. The application for tariffs under consideration relates to LEC customers in the Montserrado and Margibi counties.

The objectives of the report are threefold:

(a) to satisfy the legal requirement as in the 2015 ELL,

(b) to enhance transparency and accountability in the tariff setting process, and

(c) to keep record as a source of information to the general public and academia.

The report comprises Four (4) Sections as follows:

**Section 1** **Background**: this section provides the overview of the legal and mandatory requirements of the electricity tariff processes followed by the LERC in the determination of the 2022-2024 electricity tariffs;

**Section 2** **Tariff Determination Analysis**: this section contains an analysis of the application for tariffs including the methodology and assumptions used in determining the tariffs;

**Section 3** **Financial Considerations**: this section discusses the financial considerations taken into account in arriving at the final aggregate revenue requirement for the tariffs; and

**Section 4** **Final Tariff Schedules**: this section discusses the principal objectives underlying the tariffs as well as the structure and end-user rates approved by the BoC for gazetting.

The tariff processes and decisions have been arrived at by the Board of Commissioners (BoC) of LERC in order to achieve the following key outcomes:

(i) Firstly, that LEC has **strong liquidity and profitability position** that is improving over time in the three-year control period,

(ii) Secondly, that LEC has a strong **free cash position** that will underpin its operations in the control period,

(iii)Thirdly, that the projections on **loss reduction strategy,** if implemented correctly, will be a win-win outcome both for LEC and the customers at a microeconomic level and a big gain for the economy. A lot of collaborative work needs to be done between the LERC and LEC to achieve good results. In that regard, LERC will expedite the establishment of the relevant **Compliance Monitoring Team** which, shall submit quarterly reports that would highlight any deviation from this tariff decision to ensure remediation.

(iv) Fourthly, that the **least cost production strategy determined by LERC for LEC** for the control period be adhered to in order to ensure reasonable and affordable costs to consumers. It is on that basis that this strategy will be discussed and reviewed regularly between LERC and LEC to ensure LEC avoids cost overruns, thereby minimizing financial challenges to the sector and the economy in general.

## 2.0 Background

The Liberia Electricity Regulatory Commission (LERC) was established by the 2015 Electricity Law of Liberia (2015 ELL) to regulate the electricity supply industry. A key component of LERC's regulatory oversight is to determine cost-reflective electricity prices for operators in the industry.

Under section 8.1(1) of the 2015 ELL, the specific functions of LERC with regards to setting or approval of tariffs are that the tariff:

(i) must enable an efficient licensee to recover the full cost of its licensed activities, including a reasonable margin or return;

(ii) must provide for or prescribe incentives for continued improvement of the technical and economic efficiency with which services are to be provided;

(iii) must give end users proper information regarding the costs that their use imposes on the licensee's business;

(iv) must avoid undue discrimination; and

(v) may permit the subsidization of tariffs to certain classes of customers.

Further, according to sections 8.1(2) and 8.1(3) of the 2015 ELL respectively, a licensee shall not charge any other tariff than that determined by the Commission unless the Commission approves a deviation from the approved tariffs in prescribed circumstances. In addition to the requirements of the ELL, the Commission's tariff determinations are further made in accordance with the ETR and MYTM issued by the Commission.

## 2.2 Regulated Entities

The entities under the regulatory purview of LERC are those that are issued a license or a permit by LERC to operate in the electricity sector of Liberia. Currently, there are three regulated operators in Liberia. These are:

a. The Liberia Electricity Corporation (LEC), the government-owned utility has been issued five separate licenses for generation, transmission, distribution, importation as well as the Transmission System Operator (TSO) license;

b. the Jungle Energy Power (JEP), a privately-owned entity is licensed to operate the distribution network in Nimba County, and

c. the Totota Electric Cooperative (TEC), a cooperative of consumers issued a permit to operate a mini grid in Totota, Bong County.

### 2.3 The Tariff Determination Process

The 2022-2024 Tariff process covers tariffs for LEC and its customers. The tariffs for JEP and the other entities which are yet to be reviewed are not the subject of this report.

In the exercise of its regulatory function, the Commission requested a tariff application from the LEC to kick start the tariff setting process on May 21, 2021. The tariff application request provided enough details regarding the data and information required by LERC to undertake its analysis to ensure that the approved tariffs would meet the requirements of the law as well as the ETR and the MYTM.

On June 28, 2021, LEC submitted its application to the Commission for the approval of electricity tariffs payable by customers pursuant to regulation 21 of the ETR of 2021. The initial application did not meet the requirements of the Commission. To satisfy the requirements set out in the ETR and the MYTM, the Commission held a series of intensive technical engagements with LEC's technical team to obtain more information and clarification on LEC's business activities including its operating costs, revenue generated, and the challenges faced in supplying electricity to customers to complete its application. On October 25, 2021, the Commission acknowledged the completeness of LEC's application and proceeded with the tariff review in accordance with the ETR and the 2015 ELL. The Schedule for the review of LEC's application is presented in Appendix 1.

#### 2.3.1 Public Hearing

The Commission held a Public Hearing on LEC's application on November 12, 2021, at the Kailondo Hotel, Monrovia. The hearing was held in accordance with the procedure defined in the 2015 ELL, the ETR, and the LERC's Administrative Procedure Regulation (APR). Stakeholders were invited in writing while the general public was informed of the hearing via the radio and newspapers. Prior to the hearing, LERC published an abridged form of the LEC tariff proposals in selected newspapers and on its website.

At the hearing, LEC presented its tariff proposal to the public and the Commission took due notice of the comments and concerns raised by the participants. A total of 51 individuals were in attendance while 16 written submissions were received from the

stakeholders that included donors, engineering firms, businesses, civil society and the general public.

### 2.3.2 Field Visit to LEC Facilities at Bushrod

Following the Public Hearing, and besides the several, engagements between the technical teams prior to the hearing, the Commission at the highest level of management, paid a working visit, on November 25, 2021, to the LEC facilities at the Bushrod Power Enclave. The Commissions team included the Chairman, the Managing Director, Directors as well as the EU-LTTA. The LEC team included the Executive Director for Transmission and Distribution and his counterpart as well as the Manager for Thermal Generation. The field visit was intended to ascertain the preparedness of the LEC facilities at Bushrod to meet their obligations with respect to the availability of the power plants to deliver the power which they had proposed to. At the meeting, the LEC did a presentation to show the availability of the plants and the readiness to produce the projected electricity supply and also confirmed the projected supplies from the CLSG.

## 2.4 Effectiveness and Duration of Tariffs

The 2015 ELL stipulates in section 8.2 (6) that the regulator shall review tariff methodologies no less than every five years and approve tariffs for a period of no less than two years. In accordance with the above provision the duration of tariffs approved by the Commission shall be for three years until the MYTM is reviewed after five years. The effective date of a tariff shall be the reference point for its duration and it shall be the date it is approved by the BoC of LERC.

## 3.0 Tariff Determination Analysis: 2022-2024

### 3.1 General Principles

Section 3.3 of the 2015 ELL mandates the Commission to, among other functions, regulate tariffs. Regulating tariffs involves the determination of revenue requirements and approving the tariffs for operators in the electricity sector. Further, section 3.1 of the MYTM states that, since LEC is a vertically integrated utility, its tariff shall be regulated as ring-fenced activities with accounting separation while generation and transmission costs are passed through to distribution EUTs.

The Commission's tariff setting methodology for generation, transmission and distribution activities is based on the principle of efficient revenue requirement (RR) for each activity. The RR is verified against LEC's test year which is 2021. In accordance with section 8.2.3(a) of the 2015 ELL which states that no more than six months of costs may be projected, the figures of the test year are derived by adding six months' actual figures to six months' projection.

### 3.2 Efficient Costs

In accordance with the ETR and the MYTM, LERC provided for the full recovery of all operational costs that are necessary and are prudently incurred by a licensee. In determining the revenue requirement, LERC verified that the costs were economically incurred using the least cost approach for the production/procurement of electricity and that the costs of transmission and distribution are related to those assets used or usable for the provision of electricity services. All operating costs were reviewed and analyzed against prudency and efficiency. The Board approved the efficient operational costs for inclusion into the EUTs.

Given the time constraints in the past rate setting process the operational costs could not be scientifically split between controllable and uncontrollable costs. This will be subject of another study by LERC.

### 3.3 Regulated Asset Base (RAB)

The RAB represents assets that are used and usable for the provision and supply of the regulated electricity services in the Liberia Electricity Supply Industry. All assets necessary for the provision of regulated services are included after deducting depreciation on the allowable assets.

### 3.4 Revenue Requirement Determination

Revenue requirement (RR) refers to the total revenue that must be realized through annual revenue collections from End-User Tariffs to cover the costs associated with the operations of the utility.

In approving the tariffs, the Commission first determined the annual revenue requirement for LEC for each of its business activities (Generation, Transmission and Distribution) based on the formula below:

$$RR_t = OPEX_t + T_t + D_t + (WACC_t \times RAB_t)$$

Where:

$RR_t$ = Revenue Requirement for current period

$OPEX_t$ = Operating Expenses for current period

$D_t$ = Depreciation for current period

$WACC_t$ = Weighted Average Cost of Capital (rate of return) for current period

$RAB_t$ = Regulated Asset Base for current period

$T_t$ = Taxes for current period

The costs of technical and commercial losses are not reflected in the operational costs but volumes sent out are adjusted to reflect the projected losses.

For each regulated activity, the Regulated Asset Base for the current period ($RAB_t$) is calculated using the formula below:

$$RAB_t = RAB_{t-1} + CAPEX_t - D_t$$

Where:

$RAB_{t-1}$ = Closing balance of the Regulated Asset Base at (t-1)

$CAPEX_t$ = Capital Expenditure for current period

$D_t$ = Depreciation for the current period

The composite total Annual Revenue Requirement for LEC was calculated based on the considerations below:

a) Cost of optimal generation mix determined by the Commission which takes into account the current electricity generation constraints;
b) Projected price and volume of imported electricity as the Power Purchase Agreement (PPA) and Transmission Service Agreement (TSA) for the Transco-CLSG regional network is yet to be signed by the LEC;
c) Assessed operational expenses for the LEC;
d) Cost of Transmission and Distribution of Power; *O&M costs only, i.e., does not include system losses.*
e) Returns on assets financed by LEC;
f) Depreciation on all assets used in the provision of electricity services;
g) Long term debt repayments and cost of sale services.

Table 3.1 shows the summary of the RR submitted by LEC for the tariff period (2022-2024). The LEC application for a RR is set-out in table 3.1 below and consisted of operational costs by activity area including depreciation on all assets irrespective of the funding sources but excluding the Return on Regulatory Asset Base.

**Table 3.1 LEC's Revenue Requirement**

| **Operational costs** | **2,022** | **2,023** | **2,024** |
|---|---|---|---|
| Generation | 56,348 | 73,470 | 107,547 |
| Transmission | 9,605 | 9,769 | 9,744 |
| Distribution | 9,857 | 10,424 | 11,097 |
| Resellers - Commission on prepaid meter s | 1,243 | 1,491 | 1,790 |
| Return on RAB | - | - | - |
| **Revenue Requirement** | **77,053** | **95,154** | **130,178** |

*Source: LEC Application*

Table 3.2 shows the summary of the RR approved by LERC for the Tariff Period (2022-2024) and passed on to customers in the EUTs.

**Table 3.2 Summary of Revenue Requirement (RR) approved by LERC in US$ 000**

| | 2022 | 2023 | 2024 |
|---|---|---|---|
| **Total Opex** | 71,388 | 103,650 | 117,706 |
| Return on RAB | 754 | 1,555 | 1,609 |
| **Required Revenue** | **72,142** | **105,205** | **119,315** |

*Source: Calculated by LERC*

The Revenue Requirement approved by the Commission was lower than the proposals submitted by LEC. Tables 3.1 and Table 3.2. show the summary and breakdown of the RR submitted by the LEC and those approved by LERC.

A detailed breakdown of the RR approved by LERC in respect of the regulated activity area is shown in Table 3.3.

**Table 3.3 Approved LEC's RR Broken-down by activity areas in US$ 000**

| | 2022 | 2023 | 2024 |
|---|---|---|---|
| **Revenue Requirement for Generation** | | | |
| Operating Expenses (O&M) | 55,513 | 87,153 | 100,454 |
| Return on RAB | 350 | 707 | 717 |
| | **55,863** | **87,860** | **101,171** |
| **Revenue Requirement for Transmission** | | | |
| Operating Expenses (O&M) | 7,643 | 7,852 | 8,070 |
| Return on RAB | 1 | 3 | 3 |
| | **7,644** | **7,855** | **8,073** |
| **Revenue Requirement for Distribution** | | | |
| Operating Expenses (O&M) | 6,988 | 7,153 | 7,391 |
| Return on RAB | 403 | 845 | 889 |
| Commission for Resellers | 1,243 | 1,491 | 1,790 |
| | **8,634** | **9,489** | **10,070** |
| **Required Revenue** | **72,142** | **105,205** | **119,315** |

*Source: LERC*

### 3.3 Sales/Energy Revenue

The LEC's submission contained the revenue projections by type of metering category are shown in Table 3.4. It is important to note that the sales revenue takes into account total system losses resulting from the transmission and distribution activities.

**Table 3.4 LEC's Sale Revenue submission in US$ 000**

| | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|
| **Energy Revenue** | **32,310** | **150,564** | **183,947** | **209,033** |
| Postpaid Meter Sales | 14,842 | 30,204 | 32,304 | 30,204 |
| Prepaid Meter Sales | 15,131 | 117,555 | 148,278 | 174,791 |
| Medium Voltage Sales | 2,182 | 2,618 | 3,142 | 3,770 |
| Add: Power Connection Fees | 155 | 186 | 223 | 268 |

*Source: LEC's Tariff Application*

The LEC Sales Revenue in Table 3.4 that was derived by LEC did not take into consideration the reduction in the tariff level. LERC had a rigorous review of the cost and arrived at an efficient level of cost for the LEC.

Following a review of the submissions, the Commission approved sales revenue as shown in Table 3.5.

**Table 3.5 Sales Revenue calculated by the Commission** in **US$ 000**

| | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|
| **Energy Revenue** | **32,310** | **88,223** | **117,137** | **144,693** |
| Postpaid Meter Sales | 14842 | 67,912 | 85,841 | 93,887 |
| Prepaid Meter Sales | 15131 | 15,389 | 18,105 | 21,021 |
| Medium Voltage Sales | 2182 | 3,703 | 11,442 | 27,499 |
| Add: Power and Connection fees | 155 | 1,218 | 1,749 | 2,285 |

*Source: LERC Tariff Calculation*

The approved sales revenue represented reductions of 41.0%, 36.3% and 30.8% for 2022, 2023 and 2024 respectively compared to LEC's sales revenue proposal. Even though, the approved sales revenue estimates were lower than what was submitted by LEC, they are sufficient to cover the efficient total annual revenue requirement for LEC for each year of the tariff period. Table 3.6 shows the comparison of annual approved sales revenue against approved RR for the tariff period.

**Table 3.6 Approved Sales Revenue versus Approved RR in US$'000**

| Year | Approved Sales Revenue | Approved RR | Difference |
|---|---|---|---|
| 2022 | 88,223 | 72,142 | 16,081 |
| 2023 | 117,137 | 105,744 | 11,393 |
| 2024 | 144,693 | 119,397 | 25,296 |

In deriving the energy sales revenues, the Commission ensured that:

a) Growth projections in electricity consumption is based on the portion of the customer base that pays for electricity, and also captures projected new connections from ongoing donor financed expansion projects;
b) Permissible pass-through charges like the Regulatory Levy covering the LERC admin costs are sufficiently covered;
c) The aggregate technical and commercial losses projected by LEC and approved by LERC as shown in Table 3.7 below for each year of the tariff period.

**Table 3.7 Approved Loss Trajectory**

| Losses Type | 2022 | 2023 | 2024 |
|---|---|---|---|
| Technical Losses | 8.00% | 8.00% | 8.00% |
| Commercial Losses | 36.00% | 25.00% | 16.00% |

*Source: LEC's Business Plan*

d) Sales revenue estimates are fully accounted for from the approved rates and tariff revenue for each category of customers inclusive of fixed charges and the regulatory levy; and
e) The sale revenue estimates fully cover the efficient annual revenue requirement for LEC for each year of the tariff period.

### 3.4 Generation

The LEC tariff application provided a month-on-month power demand Forecast covering the entire period 2022-2024. These projections were based on 2021 actuals and ongoing electricity expansion projects that will increase network demand. The projected demand forecast was divided into three consumption periods from 00:00hrs – 08:00hrs; 08:00hrs – 16:00hrs and 16:00hrs – 24:00hrs respectively. An economic merit order load dispatch

of the power generation sources for an efficient generation mix planning was deployed to respond to network demand between the periods indicated.

### 3.4.1 Power Generation/Supply Sources

The power generation sources include the existing power plants (Mt. Coffee power plant, Bushrod power plants). No new power generation additions are expected to come online during the tariff period 2022-2024. Currently, LEC's electricity supply system has an operational generation capacity of 111 MW comprising about 78MW of hydropower capacity and 33MW thermal plant capacity operated on Heavy Fuel Oil (HFO) and Light Fuel Oil (LFO). There are also imports from Cote d'Ivoire available through the CLSG line that are covered under a Power Purchase Agreement (PPA) and a Transmission Service Agreement (TSA).

Electricity supplies from CIE through Transco CLSG lines were projected during the tariff period. Cost of the CLSG supplies used for the tariff determination are those contained in the power purchase agreement (PPA) under negotiation between Transco CLSG and LEC. The challenge with this source is the uncertainty of supplies during the first quarter of 2022 as a PPA is still being negotiated. However, the calculations have taken this uncertainty into account by ensuring that the estimated total annual electricity supply from CIE is adjusted and supplemented with local thermal supplies to account for the uncertainties during the early part of 2022.

### 3.4.2 Demand and Supply Balance/Schedule

The LEC submitted demand projections for the period 2020-2024 including a breakdown by customer category. For purposes of tariffs, LEC customers are categorized into (i) social tariff category; (ii) residential; (iii) Non-residential; and (iv) medium voltage. The projected profile of the customer categories over the tariff period submitted by LEC is shown in Table 3.8 below.

**Table 3.8 Number of customers per category of consumers**

| Customer Category | 2022 | 2023 | 2024 |
|---|---|---|---|
| Social Tariff | 13,263 | 18,691 | 24,119 |
| Residential | 17,972 | 25,312 | 32,652 |
| Non-Residential | 5,497 | 8,012 | 10,525 |
| Medium Voltage | 3 | 10 | 28 |
| **Total** | **36,735** | **52,024** | **67,324** |

*Source: LERC Tariff Model*

**Table 3.9 Projected consumption by customer category**

| Demand Sources | 2022 | 2023 | 2024 |
|---|---|---|---|
| Social | 4,930 | 6,948 | 8,966 |
| Residential | 209,846 | 269,626 | 322,693 |
| Non Residential | 160,930 | 190,878 | 180,478 |
| Medium Voltage | 19,489 | 60,222 | 144,733 |
| **Total** | **395,195** | **527,674** | **656,871** |

*Source: LERC Tariff Model*

**Table 3.10 Projected share of customer category in total consumption over the tariff period – 2022-2024**

| Customer Category | Share of Customers | Share of Total Consumption |
|---|---|---|
| Social Tariff | 36.00% | 1.30% |
| Residential | 48.70% | 51.00% |
| Non-Residential | 15.30% | 34.70% |
| Medium Voltage | 0.02% | 13.00% |

*Source: LERC Tariff Model*

While the number of customers in the Social Tariff band is appreciable (36%), their consumption is only 1.3% which is comparatively very low. Residential customers are the most prominent category with 48.7% of the customer base and about half of the total consumption.

The data on customers' profile was compiled from database which was developed from surveys conducted by Tetra Tech Consulting Limited as part of the Cost-of-Service Study for Liberia funded by the MCA-L under the Millennium Challenge Corporation support to the LERC.

These projections were reviewed by the Commission and discussed with LEC for further clarifications. Table 3.11 shows the demand/consumption projections by category of customers as submitted by LEC and approved by the Commission.

**Table 3.11 Projected Customer Demand/Consumption – 2022-2024 (in MWh)**

| Demand Sources | 2022 | 2023 | 2024 |
|---|---|---|---|
| Social | 4,930 | 6,948 | 8,966 |
| Residential | 209,846 | 269,626 | 322,693 |
| Non Residential | 160,930 | 190,878 | 180,478 |
| Medium Voltage | 19,489 | 60,222 | 144,733 |
| **Total** | **395,195** | **527,674** | **656,871** |

*Source: LEC's Tariff Application*

The demand for electricity is projected to rise from 395,195.3MWh in 2022 to 656,870.7MWh in 2024, representing an overall demand growth of 66% and an average annual growth rate of 29%. From Table 3.11 it can be seen that the immediate big increase in demand is in the residential customer prepaid and postpaid categories, Non-Residential postpaid as well as new entrant medium voltage customer class. Overall demand increases 1.6 times from 2022 to 2024.

The balancing of demand and supply of power was determined via modelling the power system operations to ensure the least cost of power supply without load shedding, taking into account the availability and cost of the different sources of supply. It is important to note that the Mt Coffee hydropower plant is a run-of-the river facility and therefore is assigned priority dispatch status in the merit order dispatch schedule.

The least cost production plan is driven primarily by hydropower in the wet season, when water availability is maximum, followed by CLSG imports and then supplemented with the more expensive thermal plants running at minimum levels. In the dry season electricity production is driven by the CLSG supplies and backed up by the thermal plants with hydropower supplies running at the minimum levels.

The LERC analytical review team developed the least cost production projection for volumes sent-out from the different sources of generation and imports received from the CLSG line based on economic merit order scheduling. The costs assigned to the various sources of supply used in the modelling are shown in Table 3.12 below.

**Table 3.12 Costs assigned to sources of supply (in US$/MWh).**

| Generation/Supply Sources | 2022 | 2023 | 2024 |
|---|---|---|---|
| Mt. Coffee | 60 | 60 | 60 |
| Actual HFO | 141.6 | 141.6 | 141.6 |
| Actual LFO | 211.7 | 211.7 | 211.7 |
| CLSG | 139.4 | 139.4 | 139.4 |

*Source: LERC Efficient Generation Mix Datasheet*

The detailed projected monthly load and supply profile developed by the Commission from the least cost modelling exercise is contained in Appendix 2. The summary of resulting least-cost production mix of power supply from the modelling exercise are shown in Table 3.13.

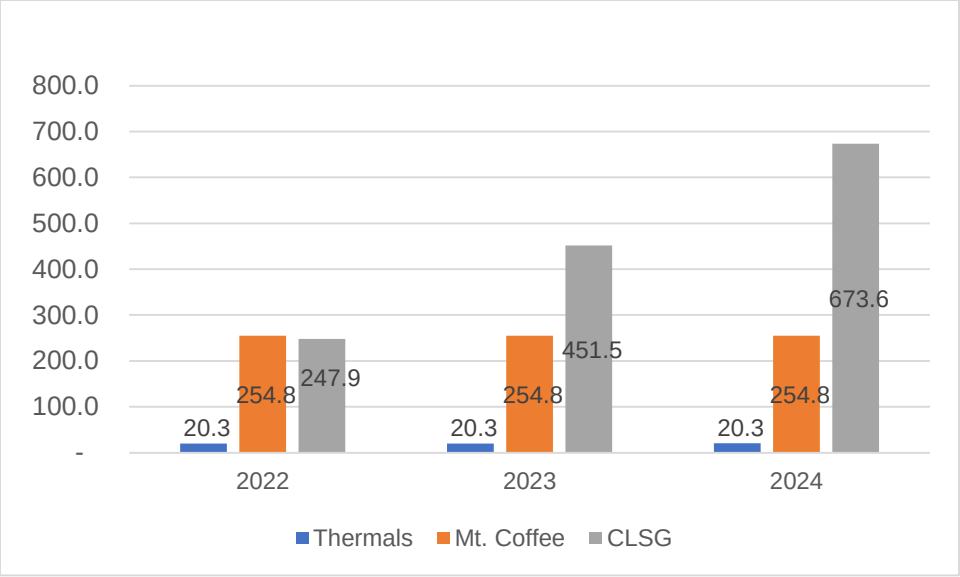
**Table 3.13 Aggregate Generation/Supplies by source (in MWh)**

| Generation/Supply Sources | 2022 | 2023 | 2024 |
|---|---|---|---|
| Mt Coffee | 254,754 | 254,754 | 254,844 |
| Actual HFO | 14,480 | 14,480 | 14,560 |
| Actual LFO | 5,792 | 5,792 | 5,824 |
| CLSG | 247,910 | 451,523 | 673,622 |
| **Total** | **522,936** | **726,549** | **948,850** |

*Source: LERC Approved Generation Mix*

The Commission adopted and applied the above generation/supply mix resulting from the least cost dispatch modelling exercise. The share of imports via the CLSG system rises significantly from 47.4% of supply in 2022 to 62.1% in 2023 and 71.0% in 2024. The rise in CSLG in the mix leads to a reduction in the average price of electricity over the period as the share of the more expensive thermal generation diminishes. Figure 3.1 shows the generation mix profile over the period 2022-2024.

**Figure 3.1 Electricity Supply Mix by type of generation (in GWh) for 2022 – 2024**




### 3.5. Total Operating Expenses (OPEX)

The total Opex for LEC, besides the projected cost of imported electricity, covers other operational expenses associated with domestic thermal generation of electricity. The Opex consists of the two major components in direct operational and maintenance expenses as well as financing costs such as depreciation but excluding return on assets as follows:

(i) direct operational expenses comprising salaries and other employee benefits, operation and maintenance costs, and general administrative expenses (including interest on working capital); and

(ii) depreciation and return on the Regulatory Asset Base (RAB).

The exclusion of the return on assets is the major difference between the RR as calculated and the Opex.

Table 3.14 shows the Opex submitted by LEC by functional activity – generation, transmission and distribution.

**Table 3.14 LEC OPEX in US$'000**

| | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|
| **Operational Expenses** | **43,679** | **77,053** | **95,155** | **130,178** |
| **Resellers** | **864** | **1,243** | **1,491** | **1,790** |
| Commission on prepaid meter sales | 864 | 1,243 | 1,491 | 1,790 |
| **Generation** | **28,005** | **56,348** | **73,470** | **107,547** |
| Fuel for generation (incl.storage) & IPP Costs | 7,270 | 10,817 | 12,237 | 13,461 |
| Lubricants & solvents | 1,905 | 3,937 | 4,384 | 4,935 |
| Salaries and other employees' benefits | 3,496 | 3,499 | 3,499 | 3,499 |
| Maintenance O&M Contract | 3,761 | - | - | - |
| Maintenance O&M | - | 3,524 | 3,700 | 4,070 |
| Camp Costs | 1,883 | 1,920 | 1,920 | 1,920 |
| Insurance costs | 789 | 630 | 630 | 630 |
| Depreciation Expense | 8,651 | 9,296 | 12,014 | 12,501 |
| Transport Fuel & Vehicles expenses | 38 | 42 | 48 | 49 |
| CLSG | | 22,430 | 34,733 | 66,116 |
| Other | 212 | 254 | 305 | 366 |
| **Transmission** | **7,840** | **9,605** | **9,769** | **9,744** |
| Salaries and other employees' benefits | 3,090 | 3,092 | 3,092 | 3,092 |
| Materials | 1,787 | 2,256 | 2,231 | 2,010 |
| Depreciation Expense | 2,789 | 4,057 | 4,221 | 4,392 |
| Transport Fuel & Vehicles expenses | 174 | 200 | 225 | 250 |
| **Distribution** | **6,969** | **9,857** | **10,424** | **11,097** |
| Salaries and other employees' benefits | 2,042 | 2,044 | 2,044 | 2,044 |
| Materials | 1,742 | 1,440 | 1,440 | 1,440 |
| Depreciation Expense | 1,858 | 3,013 | 3,135 | 3,262 |
| Transport Fuel & Vehicles expenses | 393 | 400 | 400 | 489 |
| Street Lights Contractor | 523 | 589 | 589 | 500 |
| Other Expenses/Costs | 411 | 498 | 521 | 550 |
| Bad Debt | | 1,873 | 2,295 | 2,812 |

*Source: LEC's Tariff Application*

### 3.5.1 Efficient Operational Costs Analysis

In setting the operational cost, the Commission first determined the cost of the optimal generation mix that ensures the projected system demand is served without any load shedding including the losses. The projected cost of the imported electricity, the wheeling charge of Transco-CLSG, and the prices of Light Fuel Oil (LFO) and Heavy Fuel Oil (LFO) for the Bushrod Thermal Plants and the cost of Mount Coffee Hydro supplies all affect the operating expenses of LEC and have been considered in this determination.

The Commission, after analyzing the various Opex components, approved operating expenses over the three-year tariff period. Table 3.15 shows the breakdown of LEC's

operational expenses as approved by the Commission based on the efficient-costs analysis undertaken by the Commission. In undertaking the efficient-costs analysis, the Commission reviewed each item in the build-up of Opex taking into account the historical Opex expenses of LEC as well as current prices and best engineering estimates. The Opex were discussed with staff of LEC to ascertain the veracity of the expenses as submitted by LEC. These are the following observations:

- **Salaries and other employees' benefits**
  It covers salaries of staff and contractors and other benefits that are approved by the LERC. The Commission allowed US 8.63 million for salaries and other employees benefits as was proposed by LEC in its application. These costs are flat during the control period showing the rigor of the analysis:
- **Materials Cost**
  Material costs only show modest increases from 2022 to 2024. The drop from the test year in 2021 indicates the elimination of inefficient expenditure.
- **Depreciation Expense**
  Increase in depreciation expenses from 2021 going forward is the result of asset additions.
- **Transport Fuel & Vehicle expenses**
  The costs are flat with modest increase as operations change.

Following the analysis, the Commission arrived at what it considered Opex based on efficient operations within the Liberian context. Inefficient duplication and wastage were cut or reduced to reasonable levels. Table 3.15 shows the efficient Opex as determined by the Commission.

**Table 3.15 LERC's Efficient Opex Calculation in US$'000**

| | | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|
| **Operational Expenses** | | **43 678** | **72 142** | **105 205** | **119 315** |
| Resellers | | 864 | 1 243 | 1 491 | 1 790 |
| Return on RAB | | | 754 | 1 555 | 1 609 |
| **Generation** | | **28 005** | **55 513** | **87 153** | **100 454** |
| Fuel for generation (incl.storage) | | 7270 | 3 015 | 3 015 | - |
| Lubricants & solvents | | 1905 | 1 340 | 1 420 | 1 506 |
| Salaries and other employees' benefits | | 3496 | 3 499 | 3 499 | 3 499 |
| Maintenance O&M Contract | | 3761 | 1 919 | 2 319 | 2 419 |
| Camp Costs | | 1883 | 960 | 960 | 960 |
| Insurance costs | | 789 | 630 | 630 | 630 |
| Depreciation Expense | | 8651 | 9 296 | 12 014 | 12 501 |
| Transport Fuel & Vehicles expenses | | 38 | 42 | 48 | 49 |
| Other | | 212 | 254 | 305 | 366 |
| CLSG | | 0 | 34 559 | 62 942 | 78 525 |
| | | | | | |
| **Transmission** | | **7 840** | **7 643** | **7 852** | **8 070** |
| Salaries and other employees' benefits | | 3090 | 3 092 | 3 092 | 3 092 |
| Materials | | 1787 | 294 | 314 | 336 |
| Depreciation Expense | | 2789 | 4 057 | 4 221 | 4 392 |
| Transport Fuel & Vehicles expenses | | 174 | 200 | 225 | 250 |
| | | | | | |
| **Distribution** | | **6 969** | **6 988** | **7 153** | **7 391** |
| Salaries and other employees' benefits | | 2042 | 2 044 | 2 044 | 2 044 |
| Materials | | 1742 | 856 | 876 | 896 |
| Depreciation Expense | | 1858 | 3 013 | 3 135 | 3 262 |
| Transport Fuel & Vehicles expenses | | 393 | 400 | 400 | 489 |
| Street Lights Contractor | | 523 | 177 | 177 | 150 |
| Other Expenses/Costs | | 411 | 498 | 521 | 550 |

*Source: LERC efficient OPEX*

### 3.5.2 Generation/Supply Costs

Total costs attributed to fuel declined over the tariff period when compared to 2021 due to minimal utilization of the thermal plants only as backup to supplement supplies. The noticeable expense addition from 2022 to 2024 is a result of the costs of increasing

volumes of imported energy from Cote d' Ivoire through the CLSG line. The electricity supply profile over the tariff period is shown in Figure 3.2 below.

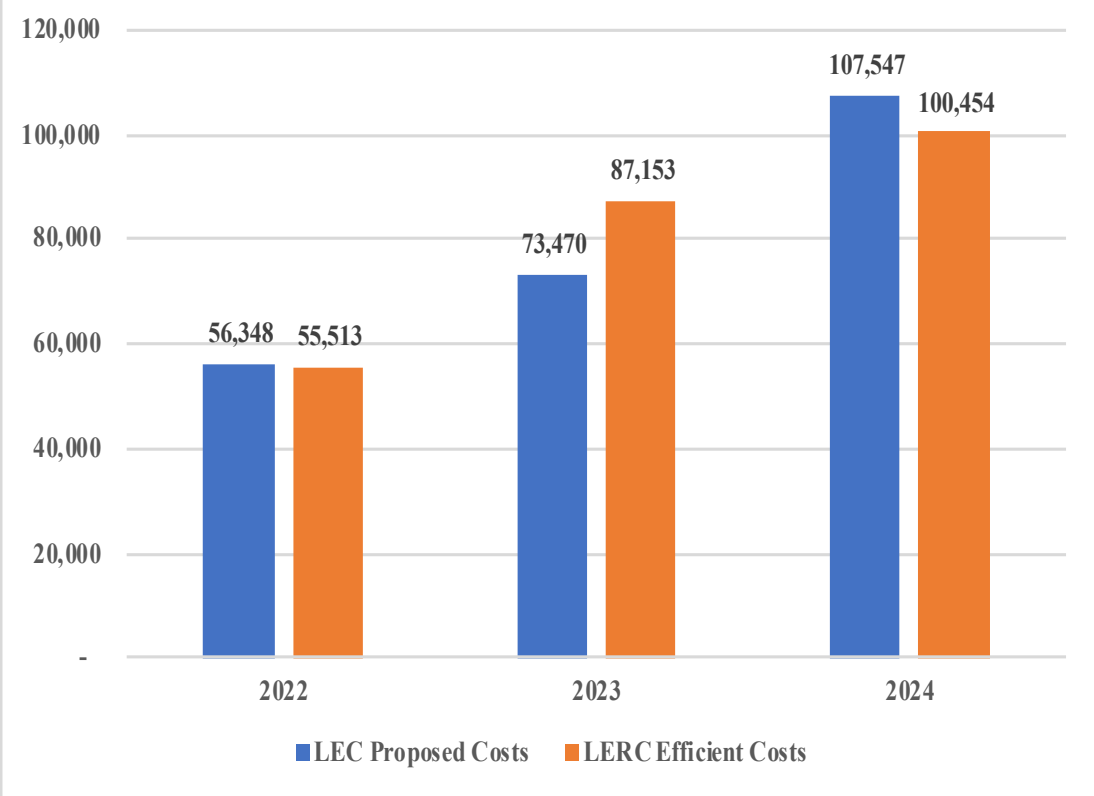



**Figure 3.2 Electricity supply profile by source (in MWh)**

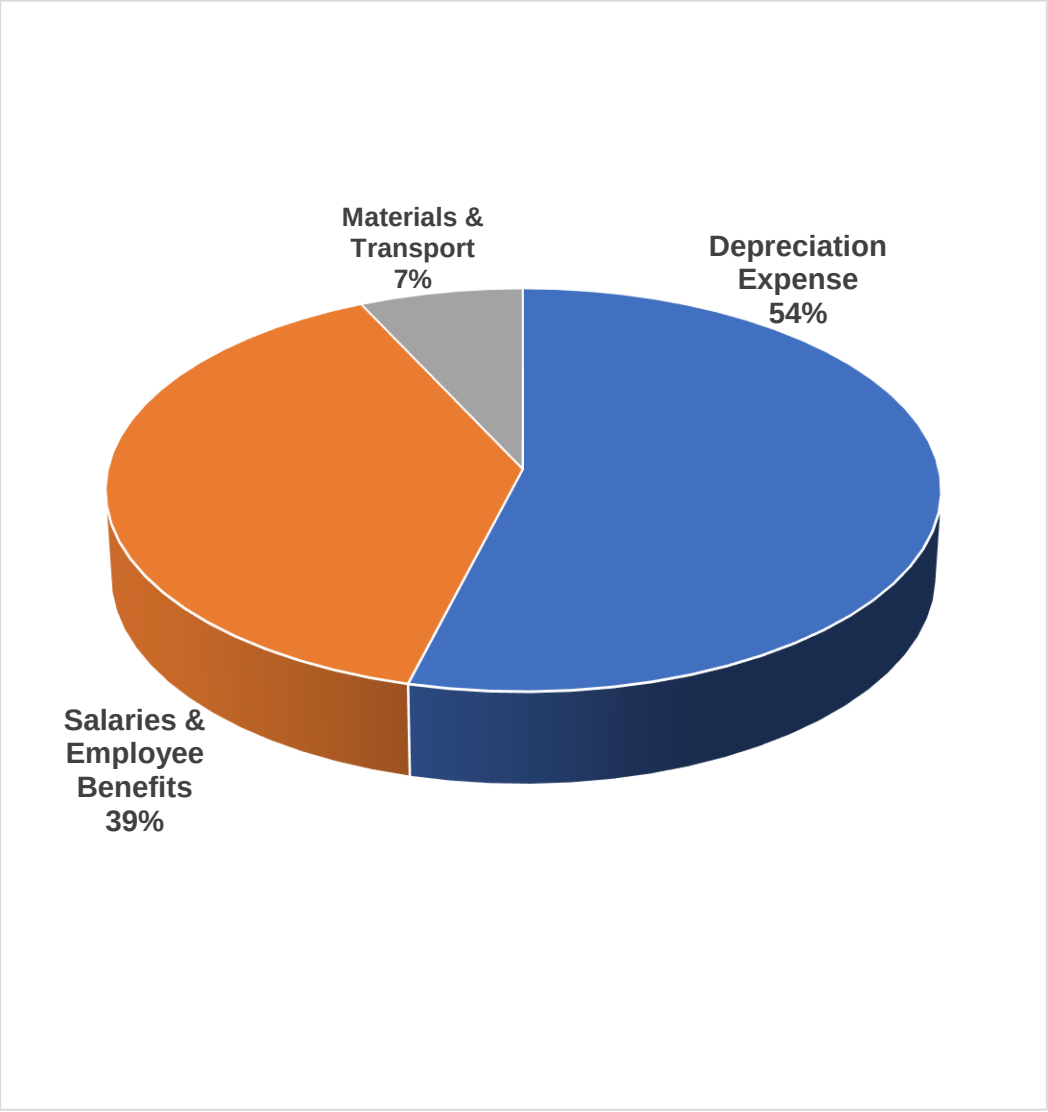
The supply profile includes losses therefore the costs associated with the supply are those determined at the power plant gate and the total cost of CSLG at the point of injection into the Liberia transmission network. In order words, the cost of supply includes the cost of all the system losses.

### 3.5.3 Transmission Opex

LEC Transmission is operated on the 66kV lines stretching over a distance of about 80km in Liberia. In determining the transmission ring-fenced OPEX costs, the Commission has noted that transmission of power is a monopoly business, and will ensure that the requisite regulatory oversight will guarantee that these costs are prudent, efficient, and

justifiable. Transmission expenses consists of four major cost items: (i) salaries and other employee costs; (ii) materials; (iii) transport fuel and vehicular expenses; and (iv) depreciation expense. Transmission expenses over the tariff period, are largely driven by increases in depreciation expenses which constitutes about 54% of the transmission expenses. Figure 3.3 shows the shares of various components of transmission system costs.

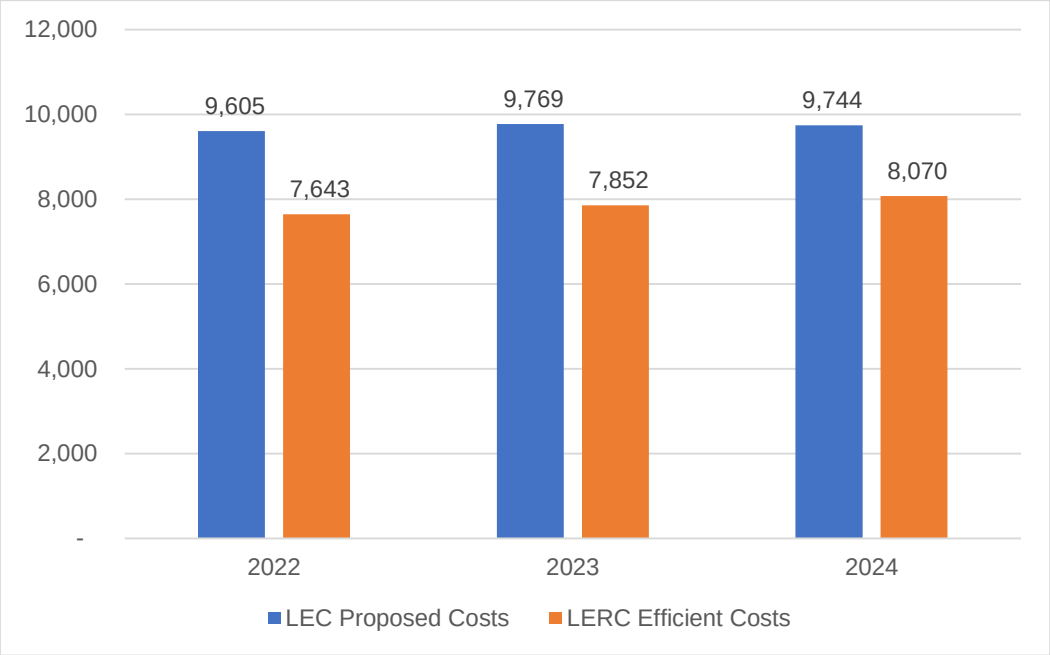
**Figure 3.3 Shares of transmission Opex component**




*Source: LERC Tariff Model*

Figure 3.4 below shows the costs comparison of the evolution of LEC proposal versus the approved LERC distribution expenses.

**Figure 3.4 Proposed versus Approved transmission OPEX in US$'000**

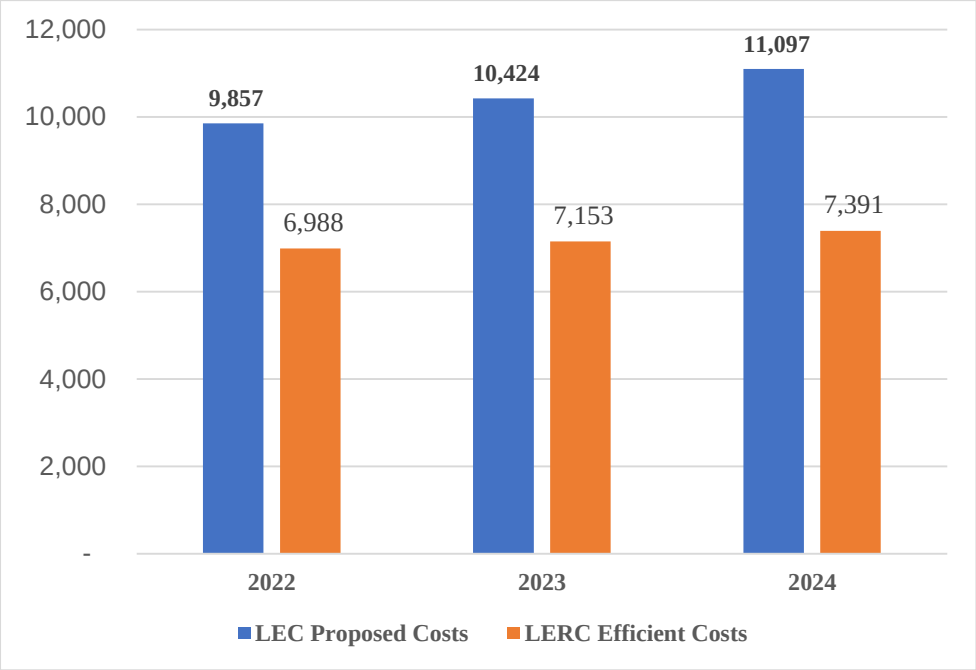



As a business associated with only the network infrastructure, the transmission cost represent value added costs directly related to the transmission business only and does not include the costs of the energy injected into the network.

### 3.5.4 Distribution Opex

The LEC operates 259km of 22kV and 33kV distribution network. Electricity is supplied to customers at 220V single phase supply or 415V three phase supply. LEC customers are located in Montserrado and Margibi counties. It is expected that customers who left the grid will migrate back to take advantage of the lower price regime, especially if LEC will work hard to improve reliability and safety. Peak demand has been estimated to grow above the historical 44.5MW to cover demand growth especially the commercial and medium voltage customers. Figure 3.5 shows the cost comparison of the evolution of LEC proposal versus the approved LERC distribution Opex.

**Figure 3.5 Proposed versus Approved distribution OPEX in US$'000**




Being a business associated with only the network infrastructure, it is important to note that the distribution cost represents value added costs directly related to the distribution business only irrespective of the energy costs.

## 4.0 Financing Considerations

The financing considerations are intended to provide for the financing aspects of the operations of LEC in respect of infrastructure development, capital expenditure, and return on investment. It is observed that substantial capital investments in the electricity sector of Liberia have been done through grant funding by donors and development partners. The GoL investments in LEC are minimal. This situation has resulted in low financing costs to the sector. These benefits are passed on to consumers. Table 4.1 shows the financial profile of LEC.

**Table 4.1 Financial Profile of LEC in US$'000**

| | LEC Financing | Liberia GOL Financing | Grants Financing |
|---|---|---|---|
| Generation | 243.89 | 26,936.07 | 127,759.62 |
| Transmission | 4.72 | - | 318,388.57 |
| Distribution | 2,207.34 | - | 36,145.38 |
| **TOTAL** | **2,455.95** | **26,936.07** | **482,293.57** |

*Source: LEC's Tariff Application*

### 4.1 Depreciation

The Depreciation value submitted by the LEC shows a growth in this expense item for the 2nd and 3rd years of the tariff period. This growth is a result of ongoing capital projects financed mainly by donors which are expected to form part of the asset register. The Commission has approved depreciation expense as submitted by LEC for the tariff period to be recovered from the EUTs. The approved depreciation cost captures all assets regardless of the funding sources.

### 4.2 Capital Expenditure (Capex)

The LEC's submission included Capex of US$8.78 million, US$9.00 million and US$5.29 million respectively for 2022, 2023 and 2024, the tariff period. These represent donor financed capital investments in ongoing projects. The Commission approved of these investments and captured their depreciation costs as submitted by LEC in the revenue requirement.

### 4.3 Valuation of Assets

The net asset value submitted by the LEC is US$511.69 million. This amount includes US$482.29 million or 94.3% for donor financed assets; US$26.94 million or 5.3% for Government of Liberia financed assets with US$2.46 million or 0.4% as LEC's financed assets.

### 4.4 Working Capital

Working Capital is computed by the Commission as Current Assets minus Current Liabilities for each year of the tariff period. The working capital for the LEC is US$28.9million for 2022, US$30.59million for 2023 and US$32.34million for 2024. Table 4,2 shows the breakdown of the components of working capital calculations over the period.

**Table 4.2 Working Capital Requirements in US$'000**

| | 2022 | 2023 | 2024 |
|---|---|---|---|
| **Working Capital** | **28,996** | **30,599** | **32,340** |
| Current assets: Inventories | 20,489 | 20,489 | 20,489 |
| Current assets: Trade and other receivables | 18,601 | 20,204 | 21,945 |
| Current liabilites: Trade and other payables | 9,069 | 9,069 | 9,069 |
| Current liabilites: Customers' security deposits | 1,025 | 1,025 | 1,025 |

*Source: LERC Tariff Model*

### 4.5 Long-term Debts

The LEC reported of two long-term debts with value of US$53.75million. US$50.00 million of this amount represents European Investment Bank (EIB) debt while US$3.75 million represents African Development Bank (AfDB). The principal and interest payments on these debts have been considered in the Commission's tariff determination.

### 4.6 Regulated Asset Base (RAB)

The RAB approved by the Commission is US$2.51million. This amount represents LEC's own-financed assets that are used or usable in the provision of regulated electricity services in Liberia. Hence, LEC cannot be allowed a return on donor financed assets or Government of Liberia financed assets, as those investments were not made by the company. Table 4.3 shows build-up of the RAB.

**Table 4.3 LEC's Regulatory Asset Base in US$'000**

| Regulatory Asset Base | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|
| Initial RAB | 2,505 | -15,004 | 30,962 | 32,026 |
| CAPEX | 0 | 0 | 0 | 0 |
| Working Capital Variation | -17,509 | 46,505 | 1,603 | 1,741 |
| Depreciation & Amortization | 0 | 539 | 539 | 82 |
| **Final RAB** | **-15,004** | **30,962** | **32,026** | **33,685** |

*Source: LERC Tariff Model*

### 4.7 Return on Assets

The after tax real weighted average cost of capital (WACC) was used to determine the return on asset.

$$WACC = \left(\frac{E}{D+E} \times r_e\right) + \left[\left(\frac{E}{D+E} \times r_d\right) \times (1-T)\right]$$

Where:

$D$ = Total debt in the capital structure

$E$ = Total equity in the capital structure

$r_d$ = rate of return on debt

$r_e$ = rate of return on equity; and

$T$ = Tax rate

**Table 4.4 Calculation of the Cost of Equity**

| WACC | Parameters |
|---|---|
| *Debt/(debt+equity)* | 70.0% |
| *Equity/(debt+equity)* | 30.0% |
| *Cost of debt* | 1.7% |
| *Income tax* | 0.0% |
| *Risk free rate* | 1.8% |
| *Asset beta* | 40.0% |
| *Equity beta* | 133.3% |
| *Market risk premium* | 6.0% |
| *Country risk* | 10.0% |
| *Cost of equity* | 19.8% |
| *Nominal WACC* | 7.1% |
| *Inflation rate* | 2.0% |
| *Real WACC* | 5.0% |

*Source: LERC Tariff Model*

### 4.7 Cash Flow & Liquidity

This section should include the financial ratios resulting from the Commissions decisions.

Table 4.5 shows the cash flow position of LEC over the tariff period.

**Table 4.5 Cash flow position of LEC in US$'000**

| Cash Flow | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|
| **Revenue** | | **88,223** | **117,137** | **144,693** |
| **Subsidies** | | **-** | **-** | **-** |
| **Operating expenses (O&M)** | | **71,388** | **103,650** | **117,706** |
| EBITDA | | 4,882 | (3,885) | 2,349 |
| Accounting Depreciations & Amortizations | | 16,045 | 18,618 | 18,993 |
| Earnings before interest and taxes (EBIT) | | (11,163) | (22,503) | (16,644) |
| EBIT x (1-t) | | (11,163) | (22,503) | (16,644) |
| Accounting Depreciations & Amortizations | | 16,045 | 18,618 | 18,993 |
| Capital Expenditures | | - | - | - |
| Working capital variation | | 46,505 | 1,603 | 1,741 |
| Free Cash Flow | | (41,623) | (5,488) | 608 |
| Initial Regulatory Asset Base | (15,004) | | | |
| Final Regulatory Asset Base | | | | 33,685 |
| Free Cash Flow + Regulatory Asset Base | 15,004 | (41,623) | (5,488) | 34,293 |
| Free Cash Flow + Regulatory Asset Base [Present Value] | 15,004 | (39,632) | (4,976) | 29,604 |
| **Net Present Value** | **-** | | | |

*Source: LERC Tariff Model*

## 5.0 Final Electricity Tariffs

### 5.1 Tariff Objectives

In approving tariffs, the Commission has been guided by the following objectives:

(i) simplicity, easily understood by customers;

(ii) recognized socio-economic disparities and vulnerabilities;

(iii) suitability for business operations; and

(iv) transparency, create incentives for customers to pay their bills.

## 5.2 Tariff Structure

The LEC, in its submission, proposed a tariff structure as shown in Table 5.1 below

**Table 5.1 LEC proposed tariff structure**

| LEC's Current and Proposed Tariffs Structure per customer category | | | | | |
|---|---|---|---|---|---|
| **Tariff Class** | **Rates and Charges** | **Consumption (kWh)** | **Current Tariffs in US cents (excl. GST)** | **Proposed Tariffs in US cents (excl. GST)** | **Comments** |
| Social Tariff | Variable[1] (US$/kWh) | 1-20 | 22 Cents | 22 Cents | For monthly consumption up to 20kW |
| Residential[2] Prepaid | Fixed[3] (US$/kWh) | | | | |
| | Variable (US$/kWh) | 0-100 | 35 Cents | 30 Cents | |
| | | 100-200 | | | |
| | | 200 + | | | |
| Residential Postpaid | Fixed (US$/kWh) | | | | |
| | Variable (US$/kWh) | 0-100 | 35 Cents | 30 Cents | |
| | | 100-200 | | | |
| | | 200 + | | | |
| Commercial[4] Prepaid | Fixed (US$/kWh) | | | | |
| | Variable (US$/kWh) | 0-100 | 35 Cents | 27 Cents | |
| | | 100-200 | | | |
| | | 200 + | | | |
| Commercial Postpaid | Fixed (US$/kWh) | | | | |
| | Variable (US$/kWh) | 0-100 | 35 Cents | 27 Cents | |
| | | 100-200 | | | |
| | | 200 + | | | |
| Medium Voltage[5] | Fixed (US$/kWh) | | - | - | |
| | Variable (US$/kWh) | | 35 Cents | 25 Cents | |
| Extra Large[6] Customers | Fixed (US$/kWh) | | - | - | Special Tariff to be negotiated |
| | Variable (US$/kWh) | | 35 Cents | - | |
| Street Lighting | Variable (US$/kWh) | | 35 Cents | 27 Cents | |

[1]Variable rate means the charge for energy

[2]Residential prepaid or post-paid means a non-commercial customer

[3]Fixed Charge means the charge for capacity or for recovery of fixed assets cost

[4]Commercial means non-residential customer

[5]Medium Voltage means a customer who is supplied at 22kV or 33kV

[6]Extra Large means a customer whose demand is above rating of 1500Kva per month

In order to ensure an effective and sustainable tariff regime, the Commission recognized and determined that the structure of the tariff and the rates have to be carefully engineered. In that regard, a number of issues were identified towards achieving the objectives adduced above. The issues and the decision of the Commission are discussed below.

### 5.2.1 Types of Rate Design

The Commission reviewed the proposed tariff rate structure submitted by LEC and made the following decisions regarding the tariff rate structure as contained in the gazette:

a) **Fixed Charges**: The Commission approved the introduction of fixed charges to be applied to all categories of customers except the Social Tariff category.
b) **Social Tariff**: Given the level of poverty and vulnerability of a large number of Liberian families, the Commission expanded the level of consumption for the social tariff from 20kWh per month to 50kWh per month and customers in this category shall face a uniform energy charge of US$0.1500/kWh.
c) **Residential Customers**: residential customers will face a two-part tariff structure comprising a fixed monthly charge (US$2.4800/month) and a uniform energy charge (US$0.2400/kWh).
d) **Non-residential Customers**: non-residential customers will, similar to residential customers, face a two-part tariff structure comprising a fixed monthly charge (US$10.00/month) and a uniform energy charge (US$0.22/kWh).
e) **Medium Voltage customers:** Medium Voltage customers will face a two-part tariff structure comprising a fixed monthly charge (US$50.00/month) and a uniform energy charge (US$0.1900/kWh).

### 5.3 Tariff Approval and Publication

The Commission approved and published the below rates and charges payable by customers within the LEC's network effective January 1, 2022 with the following notes:

a) The EUTs include a surcharge component of US$0.01per kWh sold to cover LERC's regulatory levy in accordance with section 13.4 of the 2015 ELL.
b) The tariffs may be adjusted by the Commission in accordance with the minor tariff review principles of the Commission's MYTM.

**Table 5.2 LEC's End-User Tariffs Approved by LERC BOC**

| TARIFF CATEGORY | END-USER TARIFF |
|---|---|
| **SOCIAL** | |
| Tariff | US$0.1500/kWh |
| Fixed Charge | N/A* |
| **RESIDENTIAL** | |
| PREPAID | |
| Fixed Charge | US$2.4800/Month |
| Energy Charge | US$0.2400/kWh |
| POSTPAID | |
| Fixed Charge | US$4.4700/Month |
| Energy Charge | US$0.2400/kWh |
| **NON-RESIDENTIAL** | |
| PREPAID | |
| Fixed Charge | US$10.0000/Month |
| Energy Charge | US$0.2200/kWh |
| POSTPAID | |
| Fixed Charge | US$12.0000/Month |
| Energy Charge | US$0.2200/kWh |
| **MEDIUM VOLTAGE** | |
| Fixed Charge | US$50.00/Month |
| Energy Charge | US$0.1900/kWh |

*Source: LERC's BoC Tariff Decision*

### 5.4 Average Bulk Generation and Network Service Charges

In addition to the EUTs, the Commission has determined the bulk charges for energy as well as the transmission added value costs and distribution added value costs.

Table 5.3 below shows the average composite charge for bulk energy generation/imports, transmission, and distribution added value costs. These charges will enable LEC and private distribution licensees to operate as separate entities in harmony as envisioned within electricity laws and regulations of Liberia.

**Table 5.3 Average Composite Bulk Generation Charge and Added Value Costs of Network Services**

| Item | US$/kWh |
|---|---|
| **Bulk Generation Charges (BGC)** | US$0.1409/kWh |
| **Transmission Service Charge (TSC)** | US$0.0193/kWh |
| **Distribution Service Charge (DSC)** | US$0.0167/kWh |

*Source: LERC Tariff Model*

## 6.0 Conclusions

The Commission has carried out its mandate in a transparent manner and in alignment with the laid down legal provisions of 2015 ELL and the associated Regulations in respect of electricity tariffs in Liberia. During the process, the Commission engaged all key stakeholders particularly the LEC, through several technical discussions, and the general public through a public hearing engagement as required by law.

The gazetted tariffs shall be in effect from January 1, 2022 – December 31, 2024. There would be periodic adjustments and reviews as may be occasioned by socio-economic conditions, or by a request from the LEC in the event of material changes in their operations and which would have significant financial impact on their operations.

**Appendix 1: Tariff Review Schedule**

| No | Activity | Delivery Date |
|---|---|---|
| 1 | Acknowledgement of complete application | October 25, 2021 |
| 2 | Publication of Notice of Pendency | October 26, 2021 |
| 3 | Publication of Abridged Application | October 26, 2021 |
| 4 | Public Hearing on LEC's Application | November 12, 2021 |
| 5 | BoC's decision on LEC's Proposal | December 10, 2021 |
| 6 | Formal Notice of BoC's decision to LEC | December 10, 2021 |
| 7 | Publication of Decision in Official Gazette and in Newspapers | December 10, 2021 |
| 8 | Tariffs Effective Date | January 1, 2022 |

*Source: LERC Tariff Review Team*

## Appendix 2 Monthly Load and Generation/Supply Schedule for the Tariff Period

### Table 1 Monthly Load and Generation/Supply Balance for 2022

| 2022 | PEAK LOAD MW | BASE LOAD MW | CLSG KWh | GOL-LFO KWh | GOL-HFO KWh | MTC KWh |
|---|---|---|---|---|---|---|
| 22-Jan | 58 | 40 | 32,059,135 | 992,000 | 2,480,000 | 2,790,000 |
| 22-Feb | 59 | 41 | 29,863,328 | 896,000 | 2,240,000 | 2,520,000 |
| 22-Mar | 61 | 42 | 34,137,753 | 992,000 | 2,480,000 | 2,790,000 |
| 22-Apr | 63 | 43 | 34,150,636 | 960,000 | 2,400,000 | 2,700,000 |
| 22-May | 64 | 44 | 36,355,556 | 992,000 | 2,480,000 | 2,790,000 |
| 22-Jun | 66 | 46 | 36,245,921 | 960,000 | 2,400,000 | 2,700,000 |
| 22-Jul | 68 | 47 | 4,485,816 | - | - | 40,176,000 |
| 22-Aug | 70 | 48 | 5,428,939 | - | - | 40,176,000 |
| 22-Sep | 71 | 49 | 6,810,514 | - | - | 38,880,000 |
| 22-Oct | 73 | 51 | 8,273,972 | - | - | 40,176,000 |
| 22-Nov | 75 | 52 | 9,239,523 | - | - | 38,880,000 |
| 22-Dec | 77 | 53 | 10,859,248 | - | - | 40,176,000 |

*Source: LERC Efficient Generation Mix*

### Table 2 Monthly load and generation/supply balance for 2023

| 2023 | PEAK LOAD MW | BASE LOAD MW | CLSG KWh | GOL-LFO KWh | GOL-HFO KWh | MTC KWh |
|---|---|---|---|---|---|---|
| 23-Jan | 79 | 56 | 46,817,293 | 992,000 | 2,480,000 | 2,790,000 |
| 23-Feb | 81 | 58 | 43,560,166 | 3,472,000 | 992,000 | 2,520,000 |
| 23-Mar | 83 | 59 | 49,679,661 | 3,248,000 | 928,000 | 2,790,000 |
| 23-Apr | 86 | 61 | 49,524,742 | 3,472,000 | 992,000 | 2,700,000 |
| 23-May | 88 | 62 | 52,716,349 | 3,360,000 | 960,000 | 2,790,000 |
| 23-Jun | 90 | 64 | 52,551,633 | 3,472,000 | 992,000 | 2,700,000 |
| 23-Jul | 93 | 66 | 22,023,970 | 3,360,000 | 960,000 | 40,176,000 |
| 23-Aug | 95 | 68 | 23,707,624 | - | - | 40,176,000 |
| 23-Sep | 98 | 70 | 24,621,085 | - | - | 38,880,000 |
| 23-Oct | 101 | 71 | 27,227,977 | - | - | 40,176,000 |
| 23-Nov | 103 | 73 | 28,130,082 | - | - | 38,880,000 |
| 23-Dec | 106 | 75 | 30,962,719 | - | - | 40,176,000 |

*Source: LERC Efficient Generation Mix*

### Table 3 Monthly load and generation/supply balance for 2024

| 2024 | PEAK LOAD MW | BASE LOAD MW | CLSG KWh | GOL-LFO KWh | GOL-HFO KWh | MTC KWh |
|---|---|---|---|---|---|---|
| 24-Jan | 108 | 78.84 | 66,659,449 | 992,000 | 2,480,000 | 2,790,000 |
| 24-Feb | 110 | 80.3 | 63,622,114 | 928,000 | 2,320,000 | 2,610,000 |
| 24-Mar | 112 | 81.76 | 69,360,243 | 992,000 | 2,480,000 | 2,790,000 |
| 24-Apr | 114 | 83.22 | 68,429,652 | 960,000 | 2,400,000 | 2,700,000 |
| 24-May | 116 | 84.68 | 72,061,038 | 992,000 | 2,480,000 | 2,790,000 |
| 24-Jun | 118 | 86.14 | 71,043,324 | 960,000 | 2,400,000 | 2,700,000 |
| 24-Jul | 120 | 87.6 | 40,847,832 | - | - | 40,176,000 |
| 24-Aug | 122 | 89.06 | 42,198,229 | - | - | 40,176,000 |
| 24-Sep | 124 | 90.52 | 42,143,832 | - | - | 38,880,000 |
| 24-Oct | 126 | 91.98 | 44,899,024 | - | - | 40,176,000 |
| 24-Nov | 128 | 93.44 | 44,757,504 | - | - | 38,880,000 |
| 24-Dec | 130 | 94.9 | 47,599,818 | - | - | 40,176,000 |

*Source: LERC Efficient Generation Mix*

**Appendix 3: Individuals Who Made Written Submissions**

| No(s) | Name | Entity | Contact # |
|---|---|---|---|
| 1 | Akoi M. Baysah, Jr | Press Union of Liberia | 0880784828 |
| 2 | Amos Harris | Press Union of Liberia | 0770264032 |
| 3 | Anthony Kirchhoff | Monrovia Breweries Inc. | 0770162574 |
| 4 | David Freeman | Liberia Movie Industry | 0886661766 |
| 5 | Emmanuel T. Mulbah | National Association of Foreign Exchanged Bureau of Liberia | 0777008078 |
| 6 | Gerald B. Coleman | J.C. Engineering &Management Consultancy Services | 0778489196 |
| 7 | Gerald M. Fuller | European Union | 0776904626 |
| 8 | Jacob Newton | Independent Newspaper | 0776904626 |
| 9 | Joseph Tumbey | Independent Probe Newspaper | 0777941209 |
| 10 | Monny Sogbie | NAO-MFDP | 0886499118 |
| 11 | Nehemiah Diamond Kromah | Liberia National Student Union | 0778599847 |
| 12 | Nelson K. Gonwoe | Ministry of Mines and Energy | 0886341635 |
| 13 | Oliver Rouhana, Jr. | AGRORETTI | 0770819174 |
| 14 | Pewee S. Reed | National Investment Commission | 0880376864 |
| 15 | Prince Mathias Nagbe | STAR TV | 0770248668 |
| 16 | Stephen A. Gobah | MICAT | 0775869453 |

**Appendix 4: Institutions at the Public Hearing**

| # | Institutions |
|---|---|
| 1 | AGRORETTI |
| 2 | Daily Observer Newspaper |
| 3 | ECOWAS Radio |
| 4 | European Union (EU) |
| 5 | Independent Newspaper |
| 6 | Independent Probe Newspaper |
| 7 | J.C. Engineering &Management Consultancy Services (JCEMCS) |
| 8 | John F. Kennedy Medical Center (JFKMC) |
| 9 | Jungle Energy Power (JEP) |
| 10 | LIBANGO Holdings |
| 11 | Liberia Broadcasting System (LBS) |
| 12 | Liberia Electricity Corporation (LEC) |
| 13 | Liberia Electricity Regulatory Commission (LERC) |
| 14 | Liberia Movie Industry |
| 15 | Liberia National Students Union (LINSU) |
| 16 | Liberia News Agency (LINA) |
| 17 | Liberia Public Radio (LPR) |
| 18 | Liberia Revenue Authority (LRA) |
| 19 | Liberian Energy Access Practitioner (LEAP) Network |
| 20 | Ministry of Information Culture and Tourism (MICAT) |
| 21 | Ministry of Mines and Energy (MME) |

| | |
|---|---|
| 22 | Monrovia Breweries Inc.(MBI) |
| 23 | National Association of Foreign Exchanged Bureau of Liberia (NAFEBOL) |
| 24 | National Authorizing Office (NAO-MFDP) |
| 25 | National Investment Commission (NIC) |
| 26 | National Transport Association of Liberia (NTAL) |
| 27 | OK FM |
| 28 | Press Union of Liberia (PUL) |
| 29 | STAR TV |
| 30 | The Inquirer Newspaper |
| 31 | The New Dawn Newspaper |
| 32 | The News Newspaper |
| 33 | Top Consulting Inc./ Power Africa |
| 34 | Top Consulting Incorporated (TCI) |
| 35 | Totota Electric Cooperative (TEC) |
| 36 | TRUTH FM |
| 37 | United States Agency for International Development (USAID) |