



ENERGY & PETROLEUM REGULATORY AUTHORITY

**ELECTRICITY (GENERATION, TRANSMISSION,
DISTRIBUTION AND SUPPLY) TARIFF SETTING
GUIDELINES**

DRAFT REPORT

Submitted By:



Taking the University to the People
JKUAT ENTERPRISES LIMITED

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FOREWORD

The Energy and Petroleum Regulatory Authority (EPRA) developed the Electricity Retail Tariff Review Policy in 2009. The policy described tariff application procedures to be followed by regulated service providers in electricity when filling for tariff reviews and the procedures followed by EPRA in reviewing tariff applications. It is seventeen years since the policy was introduced and during the course of its use many developments have taken place.

These developments include the enactment of Energy Act, 2019 which provides for Open Access, introduction of periodic reviews of electricity tariffs and development of mini-grids by both the private sector and public sector. Moreover, the existing policy does not provide a detailed list of requisite information and format of the application to be submitted by an applicant when requesting for a tariff review which in turn led to delays in reviewing tariffs.

Based on the foregoing, EPRA realizes that it is high time the policy is reviewed and tariff setting guidelines are developed, to replace the 2009 Policy, to address the challenges encountered during the implementation of the policy and reflect new developments in the electricity sector.

In reviewing the policy, all key stakeholders were consulted and their substantive comments have been incorporated into these guidelines. These guidelines shall be applicable to regulated service providers in the electricity sub-sector as they address specific issues pertinent to the sector. To ensure that the guidelines are adopted, EPRA has developed Energy (Electricity Tariff) Regulations, 2022 which have to be read in conjunction with these guidelines

It is my sincere hope that all electricity utilities will follow these guidelines to ensure that the tariff review process is carried out efficiently and effectively. In conclusion, I would like to thank all stakeholders for their valuable contributions in preparing these guidelines. I believe your continued cooperation and interaction will grow for the betterment of the sector and the economy at large.

Daniel Kiptoo Bargarora, OGW
Director General

Energy and Petroleum Regulatory Authority.

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ABBREVIATIONS AND NOTATIONS

CAPM	Capital Asset Pricing Model
COD	Commercial Operation Date
EPRA	Energy & Petroleum Regulatory Authority
FiT	Feed-in-Tariffs
IDC	Interest During Construction
KAM	Kenya Association of Manufacturers
KPLC	Kenya Power and Lighting Company
K_d	Cost of Debt
K_e	Cost of Equity
LCPDP	Least Cost Power Development Plan
MYPD	Multi-Year Price Determination
RoR	Rate of Return
RR	Revenue Requirements
TCP	Tariff Control Period
WACC	Weighted Average Cost of Capital

1. PART I: CITATION, APPLICATION, DEFINITIONS AND INTERPRETATION

These guidelines set out the format of the regulated Tariff Review Application (hereinafter referred to as “the application”) to be used by licensed service providers (hereinafter referred to as “the licensee or the applicant”) in the electricity sub-sector. The application submitted to EPRA shall demonstrate compliance with the requirements of the relevant policies, laws, regulations, rules and best practices in the electricity sub-sector.

1.1 CITATION AND APPLICATION

- These Guidelines may be cited as Tariff Application Guidelines for Electricity sub-sector;
- These Guidelines shall apply to all Electricity Tariff Review Applications;
- These Guidelines are intended to provide guidance to Electricity sub-sector on how to derive and apply for tariff and how EPRA shall process the application and evaluate the proposed tariff.

1.2 DEFINITIONS AND INTERPRETATIONS

In these guidelines, unless the context otherwise requires:

“**Applicable law**” means any principal laws, treaties, proclamations, regulations, rules, orders and by-laws that are customarily treated in Kenya as having legally binding force and which are relevant to matters pertaining to regulation of electricity sub-sector;

“**Authority**” means the Energy and Petroleum Regulatory Authority established under Section 9 of the Energy Act, 2019;

“**Act**” means the Energy Act, 2019;

“**Capital Costs**” means actual costs prudently incurred by a licensee in connection with planning, development, financing, designing, engineering, procurement, supply, construction, installation, completion, commissioning, testing, insurance and ownership of licensed facility that is used and useful in relation to the provision of regulated service;

“**Capital Work in Progress (CWIP)**” means accumulated capital costs of an asset under construction/installation which will be capitalized or transferred to Plant in Service after commercial operation date;

"**Cost Reflective Tariff**" means a tariff which is based on all conceivable prudently incurred costs necessary to install, operate and maintain the assets and provide reasonable return to the licensee for rendering regulated services;

"**Grants**" means financial support from the government or donor agency to a licensee to meet operational or capital expenditures;

"**Reasonable return**" means the level of return on investment that a licensee would seek for enterprises of similar risk.

"**Regulatory Asset Base**" or "RAB" or "rate base" means the total cost to be depreciated over the economic life of the asset and shall include Capital Costs, Lenders Fees and Commissions, Interest During Construction, the Initial Debt Service Reserve Account Value, Development Costs and any withholding tax applied and grossed up on interest paid to the Lenders prior to the COD;

"**Revenue Requirement**" represents the total amount of money a utility must collect from customers to pay all costs including a reasonable return on investment so as to properly operate and maintain its system and meet its' financial obligations. A revenue requirement provides a basis for determining the amount of revenue to be collected through tariff.

"**Tariff Period**" means the period, in a designated number of years, for which the approved tariffs shall apply;

"**Tariff Schedule**" means the detailed set of charges to be applied by a Licensee to its customers for electricity provided;

"**Subsidy**" means a financial transfer from one entity to another in order to reduce the cost or price of services;

"**Test year**" means a period of measurement for a recent, consecutive twelve-month period consisting of a full year of operations where data is readily available.

"**WACC**" means the Weighted Average Cost of Capital or a rate of return determined in accordance with item 2.3.

1.3 LEGAL MANDATES

- a) Section 11 (c) of the Energy Act 2019 (The Act), empowers EPRA to set, review and adjust electric power tariffs and tariff structures and investigate tariff charges, whether or not a specific application has been made for a tariff adjustment.

- b) Section 11 (d) of the Energy Act, 2019 empowers the Authority to prescribe the form and manner in which any application for any authority, license, consent or approval under the Act shall be made and the fees payable in respect of such application.
- c) The tariffs charged for electrical energy supplied shall be just and reasonable to enable a licensee to, inter alia;
 - i) Maintain its financial integrity;
 - ii) Attract capital;
 - iii) Operate efficiently; and
 - iv) Compensate investors fully for the risks assumed.
- d) The Sessional Paper No. 4 on Energy requires electricity tariffs to be cost reflective in order to give signals for efficient resource use by consumers. It is envisaged that cost reflective tariffs also convey the right signals upstream to the generators in order to facilitate efficient resource utilization by electricity utilities and the economy.

1.4 GENERAL PRINCIPLES

Consistent with other governing laws, the licensee shall comply to tariff principles set forth in Electricity Tariff Setting Guidelines when submitting tariff review applications for approval by the authority. The licensee shall demonstrate as much as possible, the adherence to the guiding principles set forth below:

- i. The licensees shall submit to EPRA a Multi-year Tariff Application to be applicable for a period of three years consistent with the governing laws and regulations;
- ii. All applications shall be submitted to EPRA timely and the same shall be reviewed within the timeline specified in the Act;
- iii. Unless reasonably stated as confidential, information submitted to EPRA as part of an application will become a matter of public record, scrutiny and inquiry.
- iv. EPRA shall approve tariffs, including a tariff setting formula or methodology, to the extent that the proposed tariffs and/or methodology, and the rationale supporting them are reasonable. The burden of proof is upon the applicant to demonstrate to EPRA's satisfaction the reasonableness of any proposed tariff;
- v. Tariffs approved by EPRA shall reflect prudently incurred costs by the applicant.

That is, only just and reasonable costs incurred wholly and exclusively for provision of the regulated service will be allowed in the determination of tariff;

- vi. In determining tariffs for respective customer groups, EPRA shall ensure that tariffs approved for each customer category reflect the cost each customer category imposes on the system;
- vii. Used and useful assets in the provision of regulated service by the licensee to its customers shall be included in the Regulatory Asset Base or rate base;
- viii. In order to ensure a financial sustainability of the licensee, the applicable tariffs should enable the utility to cover both capital and operational costs as well as earn a reasonable return; The determined tariffs must be consistent with governing laws and regulations that provides for cost reflective tariffs for all regulated services;
- ix. The determined tariffs must be accompanied by noticeable improvements in the quality of services provided by licensees. Approved tariffs will be linked to quality-related and efficiency Key Performance Indicators which will be monitored during the tariff period;
- x. The determined tariffs must take into account social considerations for customers with low-income levels, that is, the tariff must remain accessible and affordable (lifeline tariff).
- xi. Any proposed tariff design or tariff structure shall encourage efficient consumption of the regulated service;
- xii. All submissions by an applicant and information provided in response to subsequent requests by EPRA, shall:
 - (a) Provide the information required by and in the form prescribed by EPRA; and
 - (b) be complete, final, correct and submitted by a duly authorized officer of an applicant;
- xiii. A tariff approved by EPRA shall be in force from the effective date provided in the Order;
- xiv. EPRA's approval or disapproval of an application shall be based upon its evaluation of the application, which shall be conducted in a fair and transparent manner;

Electricity Tariff Setting Guidelines

- xv. EPRA may, as it considers appropriate, make modifications, waivers or extensions to requirements and timelines set out in these Guidelines;
- xvi. These Guidelines shall be reviewed or amended from time to time to accommodate changes in the regulated electricity sub-sector. When making such amendments, all stakeholders and the general public may be consulted;
- xvii. All actions taken pursuant to these Guidelines shall be in accordance with the Laws of Kenya and the Regulations issued in accordance with the governing laws.

2. PART II: DETERMINATION OF REVENUE REQUIREMENT

Kenya has unbundled electricity supply chain distinctively into generation, transmission, distribution and retail. Further legislative reforms have established the System Operator¹, whose function shall be optimal scheduling and dispatch of electrical energy and ancillary services throughout the country.

These guidelines shall provide the methodology to determine revenue requirements across the electricity supply chain. The revenue requirement shall be based on prudently incurred costs including generation, power purchase costs; transmission, system operation, distribution and retailing costs; as well as a reasonable Rate of Return (RoR) on the capital invested to provide the regulated services in the electricity sub-sector.

In determining the electricity tariffs, a Revenue Requirement (RR) Methodology, also known as the Rate of Return (RoR) or the Cost of Service approach will be used.

The RR approach is framed on the principles that revenues of the regulated utilities have to cover their operating and maintenance expenses, taxes and depreciation, and have to ensure a fair rate of return on assets utilized for provision of regulated service.

This section highlights the principles considered in the determination of allowable Revenue Requirement (RR) for each segment of licensed activity. It is the basis for the costs that the applicant prudently incurs in the provision of its services.

2.1 GUIDING PRINCIPLES FOR REVENUE REQUIREMENT

Notwithstanding the generality of the RR approach, the Authority shall be governed tariff-setting principles as highlighted in applicable laws, regulations and rules; Generally, the following guiding principles should be considered when making a RR determination;

- i. the costs of making, producing and supplying the goods or services,
- ii. the return on assets in the regulated sector;
- iii. any relevant benchmarks including international benchmarks for prices, costs and return on assets in comparable industries;
- iv. the financial implications of the determination;
- v. the desirability of establishing maximum rates and charges, and in carrying out

¹ Gazette Notice No. 155 of 5th January 2022

regular reviews of rates and charges;

- vi. any other factors specified in the relevant sector legislation;
- vii. the consumer and investor interest;
- viii. the desire to promote competitive rates and attract market competition; and
- ix. any other factors the Authority considers relevant.

2.2 REVENUE REQUIREMENT FORMULA

The Revenue Requirements (RR) shall be determined by the following formula:

$$RR = O\&M + D + T + (WACC * RAB) + Z$$

Where;

RR	means	Revenue Requirement for the tariff period;
O&M	means	Operation and maintenance expenses;
D	means	Depreciation charge;
T	means	Corporate Taxes;
WACC	means	Weighted Average Cost of Capital
RAB	means	assets of the licensee which are used and useful in the provision of regulated service to the customers. The RAB can be financed by any of the three sources: tariff or equity, grants and loans
Z	means	Any shortfall in revenue realized or a claw back in case of excess revenues realized.

The applicant is required to show in detail all the cost components and justification thereon for consideration in Revenue Requirement determination. Figure 1 shows the building block of the Revenue Requirement, functionalization, classification and cost allocation.

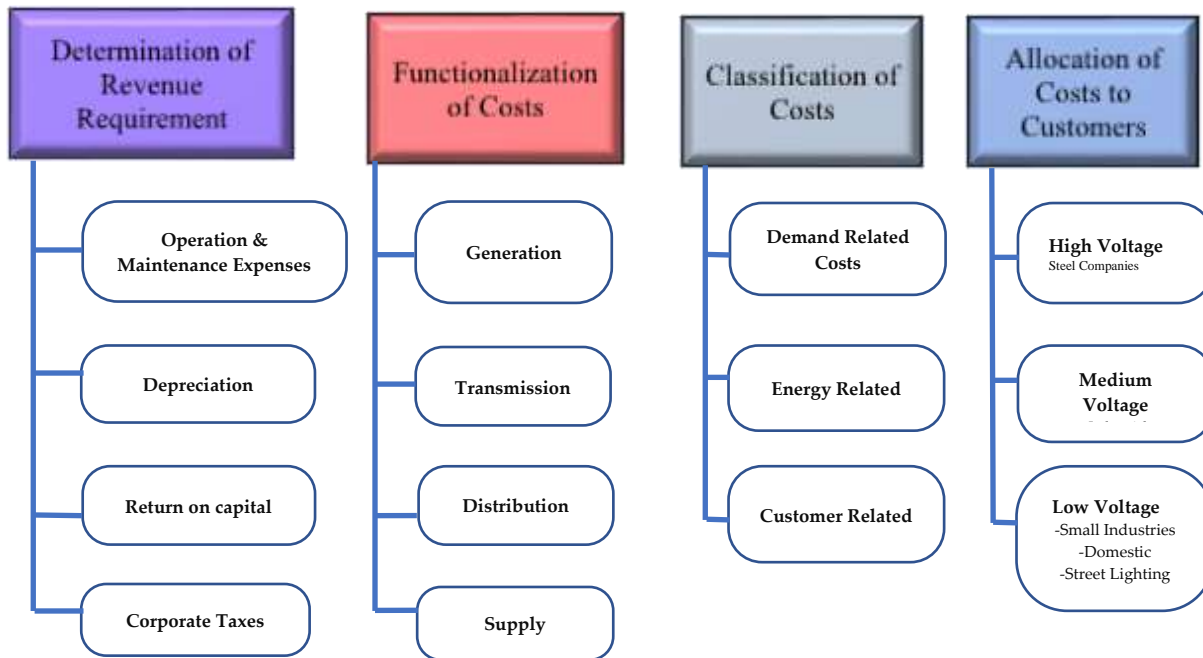


Figure 1: Building blocks of Revenue Requirement, functionalization, classification and cost allocation

2.3 ALLOWABLE OPERATION AND MAINTENANCE EXPENSES

Allowable operating and maintenance expenses relates to all expenditure just and reasonable incurred wholly and exclusively for generation, transmission, system operation, distribution and supply and marketing of electricity activities, as the case may be. The costs include:

- i. Staff costs;
- ii. Maintenance costs;
- iii. Operating costs;
- iv. Overheads;
- v. Electricity purchases (from Independent Power Producers (IPPs) and imports from neighboring countries).

The qualifying criteria for allowable operating and maintenance costs are outlined below:

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- i. Expenses must be incurred in an arm's length transactions;
- ii. Expenses must be incurred in the normal operation of providing regulated services, including a reasonable level of refurbishment (below the threshold of being capitalized), repairs and maintenance costs;
- iii. Expenses must be prudently incurred after careful consideration of available options. Such consideration would entail a competitive bidding and transparency in the procurement process;
- iv. Expenses for research and development that does not qualify to be capitalized may be included once the applicant justifies that they relate to its business operations.

Operating expenses that do not conform to the above criteria may not be included in the revenue requirement. This includes:

- i. Expenditures of a capital nature;
- ii. Donations;
- iii. Social Responsibility costs;
- iv. Penalties due to noncompliance to legal and business obligations; and
- v. Unreasonable or unjustifiable costs.

2.4 DEPRECIATION CHARGE

All used and useful assets in the provision of regulated services shall be considered in the determination of annual depreciation charge, irrespective of sources of financing, except for grant funded assets;

The depreciation component of the allowed revenue requirement shall be computed on the historical cost (original cost) of each Regulatory Asset using a straight line depreciation method over the economic useful life of the asset or project as per the following formula:

$$\text{Annual Depreciation Charge of an Asset} = \text{Cost}_H * D_R$$

where:

Cost_H is the original cost of an asset;

D_R is the Straight Line Depreciation Rate of an asset;

Funds allowed for depreciation represent a return **of** capital (while WACC x RAB discussed below represents a return **on** capital) may be used for replacement and/or

renewal of assets or may also be used for new investments;

The depreciation charge shall be determined based on regulated assets recorded in the existing Asset Register valued at historical cost.

2.5 CORPORATE TAXES

Subject to the Income Tax Act requirements, any taxes including corporate taxes paid or to be paid by the licensee, may be considered in the determination of revenue requirement.

All exempted taxes in the provision of regulated services shall not be included in the determination of revenue requirement.

2.6 REGULATORY ASSET BASE (RAB)

The Regulatory Asset Base shall cover all assets employed by the applicant in the provision of regulated activities. EPRA shall ensure that the said assets were prudently designed, competitively procured and constructed. In the event of revaluation, the increase in the value of assets shall be excluded in the RAB;

Assets held by the applicant must be used and useful for the purpose of providing regulated services and must be long-term in nature. Used and useful means that assets should be in a usable condition to supply regulated service in the short-term (i.e within 12 months) and should remain used and useful for a period of more than 12 months.

For the purposes of determining a return, assets financed by grants and /or subsidies shall not be included in the rate base. Partially financed assets may be included on a proportional basis.

Capital Works in Progress or future assets shall be excluded from the rate base until such time they are used and useful (enter into commercial operation). Upon justification by the licensee, Working Capital shall be included in the rate base and shall be determined as a proportion of the licensee's annual operating expenses. Such annual operating expenses used to determine working capital shall be adjusted where customers are on pre-paid metering.

2.7 RETURN ON REGULATORY ASSET BASE

The Return on Regulatory Asset Base (or Return on investment - ROI) for the applicant shall be calculated as the Weighted Average Cost of Capital (WACC) and determined according to the guidelines² issued by the Authority governing regulated services;

The WACC shall be determined by taking into account the following components:

- i. Cost of Equity and the gearing ratio which shall be determined by the Authority using approved methodology;
- ii. Cost of Debt shall be proposed by the licensee based on the following:
 - The Cost of Debt shall be calculated as the weighted average interest rate of the licensees' current loans;
 - The licensee shall calculate the average cost of debt and submit supporting documents including loan agreements;
- iii. The Cost of Debt of assets that are work in progress will be covered through Interest during Construction (IDC) at the actual rate and will be capitalized with asset values. The licensee shall submit detail calculation of IDC. The licensee shall include IDC when capitalizing the assets.

The Weighted Average Cost of Capital (WACC) after tax, applicable to the Regulatory Asset Base (RAB) shall be determined using the following formula:

$$WACC = Kd\left(\frac{D}{D + E}\right) * (1 - T_c) + Ke\left(\frac{E}{D + E}\right)$$

Where;

WACC = means the Weighted Average Cost of Capital expressed as a percentage required by the providers of capital (both debt and equity)

Kd = Means the weighted average cost of debt expressed as a percentage

Ke = Means the weighted average cost of equity expressed as percentage

Tc = means the applicable statutory corporate tax rate expressed in percentage

D = Means the market value of Debt expressed in KShs

E = Means the market value of equity expressed in KShs

E+D = Means the market value of the Regulated licensee expressed in KShs

² Gazette Notice No.12816 of 23rd November 2021

The cost of equity shall be determined using the Capital Asset Pricing Model (CAPM) as given hereunder:

$$K_e = R_f + \beta_e * (R_m - R_f)$$

Where;

K_e means the return on equity capital;

R_f means the risk-free rate of return;

β_e means the equity beta; and

$[R_m - R_f]$ means the return over the risk-free rate that investors would expect in order to invest in a well-diversified portfolio of equities (otherwise referred to as the equity or market risk premium)

The equity beta shall be determined using the following formular;

$$\beta_e = \beta_\alpha * \left(1 + \left(\frac{D}{E}\right)\right)$$

Whereas;

β_e means the beta on equity capital;

β_α means the asset beta; and

D/E means the debt to equity ratio.

The cost of debt capital shall be calculated using the following formular:

$$K_d = R_f + DRP$$

Where;

K_d means the cost of debt;

R_f means the risk-free rate of return; and

DRP means the debt premium that is incremental above the risk free rate that reflect additional risk of borrowing compared with Government Bonds.

2.8 GENERATION TARIFF SETTING METHODOLOGY

The generation cost shall include the Weighted cost of generation and capacity payment for specific plants and will be determined as follows;

$$WAGC \left(\frac{\$}{MWh} \right) = \frac{\sum_{i=1}^n G_i X_i + (BCC * PD)}{\sum_{i=1}^n X_i}$$

Whereas-

WAGC means weighted average generation costs

X_i means forecast total units planned to be generated by generator

i in year t and expressed in MWh;

G_i means benchmark generation costs of generator i and shall include all known variable costs;

BCC_t means benchmark capacity costs (US\$/MW), and shall be based on system peaking plants.

PD_t means peak demand in year t expressed in MW.

Fixed costs for generation shall include the cost of investment annuity (the fixed assets multiplied by the weighted average cost of capital plus depreciation) and the fixed operation and maintenance costs as follows;

$$Fixed\ Cost \left(\frac{\$}{year} \right) = (FA * WACC) + DP + Fixed\ O\&M$$

Where;

FA means Fixed Assets;

WACC means the Weighted Average Cost of Capital as determined in these guidelines;

DP means the Regulatory Depreciation, and shall be calculated using straight line depreciation.

Fixed O&M means the fixed operating and maintenance expenses that are prudently incurred

2.9 TRANSMISSION OPERATOR REVENUE REQUIREMENTS

The Revenue Requirement of the Transmission utility company shall be determined using the following methodology;

$$RR = (RAB * WACC) + D + O\&M - R$$

where,

RR means the Revenue Requirement,

RAB means the average Regulatory Asset Base

D means the regulatory depreciation.

O&M means the operation and maintenance costs which shall be prudently incurred for the provision of service by the Transmission Operator.

R shall be other revenues related to regulated activity including net amount realized through cross-border trade.

2.10 SYSTEM OPERATOR REVENUE REQUIREMENTS

The Revenue Requirement of the System Operator shall be determined using the following methodology

$$RR_{ISO} = O\&M + D - R$$

where,

RR_{ISO} means the total Revenue Requirement to be generated by customers and generators

D means the regulatory depreciation which shall be determined by the straight-line depreciation

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O&M means the operation and maintenance costs which shall be prudently incurred for the provision of service by the System Operator.

R shall be other revenues related to regulated activity including net amount realized through cross-border trade.

2.11 DISTRIBUTION AND RETAIL UTILITY REVENUE REQUIREMENT.

The revenue requirements for electricity distribution and retail utility shall be determined at the end of each established Tariff Control Period (TCP). The revenue requirement shall be determined with the following considerations;

- a) Market returns on prudent investment; computed as the product of the Regulatory Asset Base (RAB) and the allowed Rate of Return.
- b) Allowances of technical losses
- c) Prudent levels of operations and maintenance expenses comprising the cost of distribution and supply, including working capital. The costs shall include;
 - i. Power purchase costs
 - ii. Transmission costs
 - iii. Operations and Maintenance (O&M) expenses
 - iv. Depreciation; and
 - v. Applicable taxes

The revenue requirement for distribution and retail utility company shall be determined by the following methodology;

$$RR = (RAB * WACC) + E_{O\&M} + E_D + T$$

Where;

RAB *the Regulated Asset Base*

WACC *Weighted Average Cost of Capital*

E_{O&M} *Operations and Maintenance costs (includes power purchase, system operator's costs and transmission costs)*

E_D *Depreciation Expense*

T *Tax expense*

3. PART III: CUSTOMER CATEGORIES AND TARIFF DESIGN

This Chapter discusses Tariff Design. Tariffs are designed primarily for the purpose of meeting the utility's Revenue Requirement. However, tariffs are also sometimes designed for other purposes, as stated earlier in these Guidelines. Tariff design depends on revenue contribution by different categories of customers.

The Authority may evaluate retail electricity tariffs based on the Short Run Marginal Cost (SRMC) principles that reflects the cost of supplying a unit of electric power to consumers.

3.1 GUIDING PRINCIPLES FOR TARIFF DESIGN

The following principles should be considered when setting tariffs and charges for electricity sub-sector:

- i. Tariffs should reflect the cost of efficient business operations;
- ii. Tariffs should allow licensees to recover a fair return on their investments, provided that such investments have been approved by the Authority;
- iii. Costs covered by subsidies or grants provided by the Government or donor agencies shall not be reflected in the costs of business operation;
- iv. Tariff adjustment shall, to the extent possible, ensure price stability;
- v. Access charges for the use of a transmission or distribution system shall be based upon comparable charges for comparable use;
- vi. No customer class should pay more to a licensee than is justified by the costs it imposes upon such a licensee;
- vii. Tariffs should enhance efficiency in electricity consumption and should encourage adequate supply to satisfy demand

3.2 CUSTOMER CATEGORIES IN THE ELECTRICITY SUB-SECTOR

The licensee shall propose customer categories based on the level of connection and cost causation;

For each customer category, the licensee shall propose tariff that will enable it to recover the revenue requirement from the respective customer category based on cost imposed on the system by the customers;

Where a licensee is requesting modification of customer category or customer component

as part of a tariff submission in accordance with these guidelines, the licensee must also submit:

- i. estimates of the number of customers and units supplied that would have been charged under each category or component, if the proposed change in tariff categories or tariff components had been in effect over the most recent 12 months;
- ii. estimates of the revenues that would have been earned under each tariff category and tariff component, if the proposed change in tariff categories or modification of tariff components had been in effect over the most recent 12 months;
- iii. estimates of the number of customers and quantities supplied or transported that will be charged under each tariff category and tariff component in the coming 12 months, if the proposed change in tariff categories or modification of tariff components is approved;
- iv. estimates of the revenues that will be earned under each tariff category and tariff component in the coming 12 months, if the proposed change in tariff categories or modification of tariff components is approved;
- v. details of and the basis for such estimates.

3.3 PERIODIC TARIFF ADJUSTMENT APPLICATION

Regulated utilities face significant costs that are both uncertain and are therefore exposed to a considerable amount of risk relating to the fluctuations in these costs.

As a general principle, risk should be passed onto those best suited to bear it. With regard to the electricity industry players i.e. generators, transmission, distributors, supply and the consumers, each player has a different capacity to bear specific risks

The licensee is required to submit a complete set of information to enable the authority to adjust tariffs on periodic basis.

i. Fuel Energy Cost

All units billed to each Post-paid Consumer or purchased by each Pre-paid Consumer every month shall be liable to Fuel Energy Cost rate which shall be calculated in accordance with the following formula:

Fuel Energy Cost rate in Kenya cents/Unit calculated to the nearest **one cent**:

$$= \frac{1}{1-L} \times \left\{ \frac{\sum C_i G_i S_i + \sum P_{im} - \sum P_{xp} + \sum P_i}{G} \right\} \times 100$$

Where:

C_i = Actual price in KSh/kg paid by the Electric Power Producers for fuel consumed by Plant i , where $i= 1, 2, \dots n$, during the calendar month immediately preceding each Post-paid Billing Period or Pre-paid Units Purchase Period at all existing thermal plants on the Interconnected System and the Off-Grid System, as the case may be. This shall also include other thermal power plants to be constructed and in respect of which the Company shall enter into Power Purchase Agreements.

G_i = All Units generated and or purchased by KPLC from Electric Power Producers' Plant i , where $i= 1, 2, \dots, n$, during the calendar month immediately preceding each Post-paid Billing Period or Pre-paid Units Purchase Period at each existing thermal plant on the Interconnected System and the Off-Grid System, and imports/exports from Uganda Electricity Transmission Company Limited adjusted for system losses as the case may be. This shall also include other thermal power plant(s) to be constructed and in respect of which the Company shall enter into Power Purchase Agreement(s).

G = Total of all Units purchased by KPLC from Electric Power Producer(s), generated by the Company and net imports during the calendar month immediately preceding each meter reading period.

$S_i =$ Specific fuel consumption in kg/Unit for the following thermal plants³:

Muhoroni Gas Turbine I	0.315 kg/Unit purchased
Muhoroni Gas Turbine II	0.315 kg/Unit purchased
Kipevu I Diesel Plant	0.217 kg/Unit purchased
Kipevu III Diesel Plant	0.2095 kg/Unit purchased
Iberafrica Diesel Plants:	
56.346 MW Plant	0.226 kg/Unit purchased
52.5 MW Plant	0.224 kg/Unit purchased
Rabai Diesel Plant*:	
With steam turbine or above 33MW	0.200 kg/Unit purchased
Without steam turbine or below 33MW	0.211 kg/Unit purchased
Triumph Diesel Plant**	
With steam turbine or above 35MW	0.201kg/Unit purchased
Without steam turbine or below 35MW	0.210kg/Unit purchased
Gulf Diesel Plant	0.215kg/Unit purchased
Thika Diesel Plant	
With steam turbine or above 33MW	0.199 kg/Unit purchased
Without steam turbine or below 33MW	0.215 kg/Unit purchased
Diesel Plants in Off-Grid System***	
Lodwar	0.282 kg/Unit generated
Mandera	0.266 kg/Unit generated
Marsabit	0.290 kg/Unit generated
Wajir	0.260 kg/Unit generated
Moyale	0.277 kg/Unit generated

³ Gazette Notice No. 8043 of 3rd August 2018

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Habaswein	0.290 kg/Unit generated
Merti	0.290 kg/Unit generated
Elwak	0.290 kg/Unit generated
Mfangano	0.290 kg/Unit generated
Baragoi	0.290 kg/Unit generated
Lokichogio	0.290 kg/Unit generated
Takaba	0.290 kg/Unit generated
Eldas	0.290 kg/Unit generated
Rhamu	0.290 kg/Unit generated
Laisamis	0.290 kg/Unit generated
North Horr	0.290 kg/Unit generated
Lokori	0.290 kg/Unit generated
Dadaab	0.290 kg/Unit generated
Faza Island	0.290 kg/Unit generated
Lokitaung	0.290 kg/Unit generated
Kiunga	0.290 kg/Unit generated
Kakuma	0.290 kg/Unit generated

*Rabai: The higher specific fuel consumption for Rabai Diesel Plant also applies for a period of 2.5 hours during start up after a plant shutdown of more than 8 hours.

**Triumph: The higher specific fuel consumption for Triumph Diesel Plant also applies for a period of 2.5 hours during start-up after a plant shutdown of more than 8 hours.

*** Specific fuel consumption for Off-Grid System shall be estimated at 0.290 kg/unit for any other thermal power plants to be constructed for the supply of electricity to the Company from that Power Station with the approval of the Commission.

$P_{im} =$ Sum of fuel costs for imported units calculated based on respective power import contracts.

P_{xp} = Sum of fuel costs for exported units calculated based on respective power export contracts.

P_i = Sum of fuel displacement costs and other pass through charges based on power purchased from Power Plant i , where $i = 1, 2 \dots n$. This refers to Mumias, future temporary power plants, geothermal steam charge as approved by the Authority and other power plants to be constructed in respect of which KPLC shall enter into a Power Purchase Agreement.

- The fuel displacement costs, P_i , for the Mumias Power Plant shall be computed using the formula $P_i = G_i \times DCR_i$.

Where;

G_i = Units purchased by KPLC from the plant during the calendar month immediately preceding each Post-paid Billing Period and/or Pre-paid Units Purchase Period,

DCR_i = the approved Displacement Charge Rate for the plant being US\$ 0.034/kWh.

- The fuel displacement costs, P_i , for the geothermal steam shall be computed using the formula $P_i = G_i \times DCR_i$.

Where;

G_i = Units purchased by KPLC from the plant during the calendar month immediately preceding each Post-paid Billing Period and/or Pre-paid Units Purchase Period,

DCR_i = the approved Charge Rate for the plant being US\$ 0.02/kWh or any other rate approved by the Authority

- The fuel displacement costs, P_i , for the Kipeto and Prunus Wind Power Plants shall be computed using the formula $P_i = G_i \times DCR_i$.

Where;

G_i = Units generated delivered and purchased KPLC from the plant or Units curtailed from being generated by such plant as invoiced to the Company in accordance with the Power Purchase Agreement for such plant, during the calendar month immediately preceding each Post-paid Billing Period and/or Pre-paid Units Purchase Period,

DCR_i = The approved Displacement Charge Rate for the plant being US\$

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0.084/kWh.

- The fuel displacement costs, P_i , for Power Plant plants procured through the FiT Policy shall be computed using the formula $P_i = G_i \times DCR_i$.

Where;

G_i = Units generated, delivered and purchased by KPLC from the plant or Units curtailed from being generated by such plant as invoiced to KPLC in accordance with the Power Purchase Agreement for such plant, during the calendar month immediately preceding each Post-paid Billing Period or Pre-paid Units Purchase Period,

DCR_i = The approved Displacement Charge Rate for the plant being 85% and 70% of the applicable FiT tariff for Solar based plants and all other plants, respectively.

All fuel displacement and pass through costs shall be converted to Kenya Shillings using the CBK mean exchange rate of the calendar month immediately preceding each Post-paid Billing Period.

L = Target System loss factor in transmission and distribution

The Authority shall publish a monthly notice in the Kenya Gazette showing the Fuel Energy Cost rate applicable to all Units billed to every Post-paid Consumer or Units Sold with respect to Pre-paid Consumers during the month of publication of such notice.

ii. Foreign Exchange Rate Fluctuation Adjustment

All units billed to each Post-paid Consumer or purchased by each Pre-paid Consumer every month shall be liable to Foreign Exchange Rate Fluctuation Adjustment which shall be calculated in accordance with the following formula:

Foreign Exchange Rate Fluctuation Adjustment in Kenya cents/Unit calculated to the nearest **one cent**

$$FERFA_t = \frac{1}{1-L} \times \left\{ \frac{(\sum (F_{t-1} \times Z_t) X_0) + (\sum (H_{t-1} \times Z_t) X_0) + (\sum (IPP_{t-1} \times Z_t) X_0)}{G} \right\} \times 100$$

Where:

F_{t-1} = Sum of the foreign currency costs incurred by KenGen in the calendar month immediately preceding current Post-paid Billing Period or Pre-paid Units Purchase Period.

H_{t-1} = Sum of the foreign currency costs incurred KPLC other than those costs relating to Electric Power Producers in the calendar month immediately preceding current Post-paid Billing Period or Pre-paid Units Purchase Period.

IPP_{t-1} = Sum of the foreign currency costs paid by KPLC to Electric Power Producers (except KenGen) in the calendar month immediately preceding current Post-paid Billing Period or Pre-paid Units Purchase Period.

The factor Z_t is the proportionate change in the exchange rate (X_t) in the current Post-paid Billing Period or Pre-paid Units Purchase Period t from the Base Exchange rate (X_0) in the base period and shall be determined according to the following formula:

$$Z_t = \frac{X_t - X_0}{X_0}$$

Where:

X_t = CBK mean exchange rate for the calendar month immediately preceding current Post-paid Billing Period or Pre-paid Units Purchase Period.

X_0 = CBK mean exchange rate for the base period determined during tariff review;

Note: Applicable CBK mean rates for KenGen power plants with Kenya Shillings denominated charge rates are as stipulated in the respective Power Purchase Agreements.

G= Total of all Units purchased by the Company from Electric Power Producer(s), generated by the Company and net imports during the calendar month immediately preceding each meter reading period.

L = Target System loss factor in transmission and distribution

The Authority shall publish a monthly notice in the Kenya Gazette showing the amount of the Foreign Exchange Rate Fluctuation Adjustment applicable to all Unit charges specified in Part II of the Schedule of Tariffs for all meter readings taken during the month of publication of the said notice.

iii. Inflation Adjustment

(a) All units billed to each Post-paid Consumer or purchased by each Pre-paid Consumer every month shall be liable to an Automatic adjustment for inflation in January and July of every calendar year.

The effect of domestic and international inflation on cost of supply shall be calculated in accordance with the following formula:

$$INFA_t = \frac{1}{1-L} \times \left(\frac{INFA_{KenGen} + INFA_{IPP} + INFA_{KPLC}}{G_p} \right) \times 100$$

Where;

INFA_t = Total Inflation Adjustment in Kenya cents per Unit for the half year period t.

L = Target System loss factor in transmission and distribution

G_p = Total projected Units generated or purchased by KPLC from Electric Power Producer(s), during the half-year Adjustment Period. This shall also include other power plants to be constructed and in respect of which the Company shall enter into a Power Purchase Agreement.

i) **INFA_{KenGen}**

$$INFA_{\text{KenGen}} = \sum INFAKP_i$$

Where;

$INFAKP_i$ = Specific Inflation Adjustment in half-year period, relating to contracted KenGen Plant i, which shall be determined as follows:

$$INFAKP_i = [KP_i \times FOMCR_{bi} + Gk_i \times VOMCR_{bi}] \times \left[0.7 \times 0.5 \left(\frac{CPIU_t}{CPIU_b} - 1 \right) + 0.3 \left(\frac{USCPI_t}{USCPI_b} - 1 \right) \right]$$

Where:

KP_i = Contracted capacity for KenGen Plant i in kW.

$FOMCR_{bi}$ = The base escalable Capacity Charge Rate for KenGen Plant i in KSh./kW/year for the base period determined during tariff review, divided by two

$VOMCR_{bi}$ = The base escalable Variable Operation and Maintenance Charge Rate or variable energy charge rate as applicable, for KenGen plant i in KSh./kWh for the base period determined during tariff review

Gk_i = Projected Units purchased from KenGen plant i in kWh in the half-year Adjustment Period.

$CPIU_b$ = The Geometric Underlying Consumer Price Index for the base period as posted by Kenya National Bureau of Statistics (Index base – March 2009= 100), being 152.95

$CPIU_t$ = The Underlying Consumer Price Index for the month of March for adjustments effected in the period July – December; and September for adjustments effected in the period January – June every year as provided by the Kenya National Bureau of Statistics (Index base – March 2009= 100), being 152.95.

$USCPI_b$ = The “Consumer Prices Index for all urban consumers (CPI - U) for the US city average for all items 1982 - 84 =100” as published by the United States

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Department of Labour Statistics index for the base period determined during tariff review.

$USCPI_t =$ The “Consumer Prices Index for all urban consumers (CPI - U) for the US city average for all items 1982 - 84 =100” as published by the United States Department of Labour Statistics index for the month of March for adjustments effected in the period July – December; and for September for adjustments effected in the period January – June every year.

ii) $INFA_{IPP}$

$$INFA_{IPP} = \sum INFAIPP_i$$

Where,

$INFAIPP_i =$ Specific Inflation Adjustment in half-year period, relating to contracted Electric Power Producer’s (excluding KenGen) Plant i, which shall be determined as follows:

$$INFAIPP_i = [IPP_i \times CCR_{bi} + GIPP_i \times ECR_{bi}] \times \left[\frac{USCPI_t}{USCPI_b} - 1 \right] *$$

Where:

$IPP_i =$ Contracted capacity for IPP Plant i in kW.

$CCR_{bi} =$ Base escalable capacity charge rate for IPP plant i in US\$/kW/year, for base period, divided by two.

$GIPP_i =$ Projected Units purchased from IPP plant i in kWh in the half-year Adjustment Period.

$ECR_{bi} =$ Base escalable energy charge rate for IPP plant i in US\$/kWh for base period

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$USCPI_b$ = The “Consumer Prices Index for all urban consumers (CPI - U) for the US city average for all items 1982 - 84 =100” as published by the United States Department of Labour Statistics index for base period

$USCPI_t$ = The “Consumer Prices Index for all urban consumers (CPI - U) for the US city average for all items 1982 - 84 =100” as published by the United States Department of Labour Statistics index for the month of March for adjustments effected in the period July – December; and for September for adjustments effected in the period January – June every year.

*Note:

For Euro denominated costs

CCR_{bi} = Base escalable capacity charge rate for IPP plant i in €/kW/year, for base period, divided by two.

ECR_{bi} = Base escalable energy charge rate for IPP plant i in €/kWh for base period

$USCPI_b$ = The Monetary Union Index of Consumer Prices for European Union as published by Eurostat for base period

$USCPI_t$ = The Monetary Union Index of Consumer Prices for European Union as published by Eurostat for the month of March for adjustments effected in the period July-December; and for September for adjustment effected in the period January-June every year.

All inflation adjustment costs for IPPs shall be converted to Kenya Shillings using the Base Exchange rates

iii) **$INFA_{KPLC}$**

$INFA_{KPLC}$ Is the Specific Inflation Adjustment in half-year period, relating to the Company’s transmission and distribution operation and maintenance costs, which shall be determined as follows:

$$\text{INFA}_{\text{KPLC}} = \text{TDOM}_b \left[0.7 \times 0.5 \left(\frac{\text{CPIU}_t}{\text{CPIU}_b} - 1 \right) + 0.3 \left(\frac{\text{USCPI}_t}{\text{USCPI}_b} - 1 \right) \right]$$

Where;

TDOM_b = The transmission and distribution network operation and maintenance costs excluding depreciation of assets and provision for bad debts for Test year, divided by two.

CPIU_b = The Geometric Underlying Consumer Price Index for base period as posted by Kenya National Bureau of Statistics (Index base – March 2009= 100), being 152.95

CPIU_t = The Underlying Consumer Price Index for the month of March for adjustments effected in the period July – December; and September for adjustments effected in the period January – June every year as provided by the Kenya National Bureau of Statistics (Index base – March 2009= 100).

USCPI_b = The “Consumer Prices Index for all urban consumers (CPI - U) for the US city average for all items 1982 - 84 =100” as published by the United States Department of Labour Statistics index for base period.

USCPI_t = The “Consumer Prices Index for all urban consumers (CPI - U) for the US city average for all items 1982 - 84 =100” as published by the United States Department of Labour Statistics index for the month of March for adjustments effected in the period July – December; and for September for adjustments effected in the period January – June every year.

Note:

Any difference between the total inflation costs and the actual billed amount for a given half year adjustment period shall be adjusted for in the following half year period.

The Authority shall publish in the first month of the half-year inflation adjustment period a notice in the Kenya Gazette showing the half-year Inflation Adjustment rate applicable to all Units billed to each Post-Paid Consumer or with respect to Pre-paid Consumer Units sold during that half-year period.

3.4 SURCHARGES

In the event of the supply of electrical energy to the installation of any Consumer having a Power Factor of less than 0.90, then KPLC may give to such Consumer thirty days' notice in writing requiring him to improve the Power Factor of his installation to or in excess of 0.90.

If a Consumer fails to comply with such notice as aforesaid, then KPLC shall be at liberty to impose a surcharge as specified below until such time as the Power Factor of such Consumer's installation is equal, or in excess of 0.90

- i. for Consumers charged under Domestic, Small Commercial and Street Lighting categories, the payment for electrical energy consumed in each Post-paid Billing Period (exclusive of VAT, Fuel Energy Cost Charge, Foreign Exchange Rate Fluctuation Adjustment, REP and ERC levies) shall be increased by 2 per cent for each complete 1 per cent by which the power factor is below 0.90.
- ii. for Consumers charged under Commercial & Industrial categories - the payment for electrical energy consumed and chargeable KVA of Demand in each Post-paid Billing Period (exclusive of VAT, Fuel Energy Cost charge, Foreign Exchange Rate Fluctuation Adjustment, REP and ERC levies) shall be increased by 2 per cent for each complete 1 per cent by which the Power Factor is below 0.90.