



**Rate Setting Guidelines
for
Electricity Distribution Network Asset Owner**

**VOLUME 3
METHODOLOGY**

September 2018



PURPOSE, SCOPE, APPLICATION AND REVISION

PURPOSE

The purpose of the guidelines is to set out the principles, methodology and processes for the approval of tariffs in respect of network assets by an Electricity Distribution Network Asset Owner (EDNAO) by PURC. Similarly, the guidelines apply to determination of revenue requirements in respect of services performed by same. The guidelines aim to provide PURC with the information it needs to make decisions on tariff review. Finally, the guidelines provide industry participants with information to facilitate tariff application and approval processes.

SCOPE AND APPLICATION

The guidelines apply to a Public Utility or an EDNAO licensed or authorised under any law to own or operate electricity distribution assets or to provide electricity distribution and electricity supply services in the regulated market in Ghana.

EFFECTIVE DATE, REVIEW, ADDITIONS AND AMENDMENTS

- i. These guidelines shall take effect from November 2017 and revoke all guidelines previously issued by PURC for electricity distribution and supply utilities.
- ii. PURC reserves the right to review or add to the guidelines periodically. Review or addition to the guidelines shall be done in consultation with stakeholders and in accordance with the Act.
- iii. Amendments, additions and relaxations to the guidelines may be made only with the approval of the Commission.

ENFORCEABILITY

These Guidelines are issued as an Order of the Commission and are enforceable in accordance with the Public Utilities Regulatory Commission Act, 1997 (Act 538).

Approved by the Commission on the..... Day of 2018

Signed.....
Chairman, PURC

Signed.....
Executive Secretary, PURC



CONTENT AND STRUCTURE OF DOCUMENT

This document issued by the Public Utilities Regulatory Commission (PURC) constitutes the approved Rate Setting Guidelines for EDNAO taking into account roles and responsibilities of the Company. The document is organized as follows:

- Volume 1 – The main volume which is required as part of all other Volumes describes the Tariff Philosophy and Tariff Approval process, including the legal basis and minimum filing requirements underlying the rate setting guidelines for Electricity Distribution and Supply.
- Volume 3 - This Volume which is complementary to Volume 1 sets out the methodology including the formulae and principles for the determination of revenue requirements of EDNAO by PURC.

This volume is structured as below:

- Definitions and Equation Parameters
- Methodology for determination of Annual Revenue Requirements for EDNAO
- Appendix



TABLE OF CONTENT

| | |
|---|----|
| PURPOSE, SCOPE, APPLICATION AND REVISION | i |
| CONTENT AND STRUCTURE OF DOCUMENT | ii |
| DEFINITIONS..... | 1 |
| ABBREVIATIONS..... | 2 |
| EQUATION PARAMETERS..... | 3 |
| ANNUAL REVENUE REQUIREMENT FOR ELECTRICITY DISTRIBUTION NETWORK ASSET OWNER (EDNAO) 4 | |
| 1.1 Calculation of Annual Revenue Requirement..... | 4 |
| 1.2 Operating Expenses (EDNAO) for Regulatory Control Periods..... | 4 |
| 1.3 Return on RAB (LNAssets) | 5 |
| 1.4 Depreciation on RAB (LNAssets) | 5 |
| 1.5 Return on RAB (NLAssets) | 5 |
| 1.6 Depreciation on RAB (NLAssets) | 6 |
| 1.7 Corporate Tax (EDNAO) | 6 |
| 1.8 Regulated Asset Base (EDNAO)..... | 6 |
| 1.9 Weighted Average Cost of Capital | 8 |
| 1.10 Lease Payments (EDNAO)..... | 11 |
| 1.11 Adjustment in Annual Revenue Requirement (EDNAO)..... | 11 |
| 1.12 APPENDIX - Principles for Accounting for Depreciation | 12 |



DEFINITIONS

| Term | Definition |
|---|---|
| Beta | A measure of how much a company's share price reacts against the market as a whole. A beta of one, for instance, indicates that the company moves in line with the market. If the beta is in excess of one, the share is exaggerating the market's movements; less than one means the share is more stable |
| Equity Market Risk Premium | Returns investors expect to compensate them for taking extra risk by investing in the stock market over and above the risk-free rate. In other words, it is the difference between the risk-free rate and the market rate. It is a highly contentious figure. Many commentators argue that it has gone up due to the notion that holding shares has become more risky |
| Five-year Ghanaian Sovereign Bonds | Mean outstanding Dollar-denominated bonds issued by the Republic of Ghana with maturities of five years, including locally issued Dollar-denominated bonds. |
| Ghanaian Credit Rating | Means a current credit rating published by Moody's, Standard & Poor's, or Fitch for the Republic of Ghana. |
| Ghana Market Return | The return on overall market portfolio of assets over a given period of time |
| Ghana Market Risk Premium | Market risk premium, also known as equity risk premium, is the difference between expected return on a market portfolio and risk-free rate |
| Ghana Country Default Spread | A measure of Ghana's general country risk in terms of her ability to repay her debts as and when they fall due |
| Ghana Country Risk Premium | The difference between the imposed Market Interest Rates for Ghana and Comparable interest rates for the United States of America |
| Lease Payments | The Lease Payments for a Regulatory Year (Regulatory Year 't') shall equal the sum of the return on legacy assets plus depreciation on legacy assets as determined by PURC based on filings by EDNAO, stated in nominal US Dollars. |
| LIBOR | The London interbank offered rate administered by ICE Benchmark Administration Limited (or any other person which takes over the administration of that rate) for US Dollar deposits for a six (6) month period displayed on pages LIBOR01 or LIBOR02 of the Thomson Reuters screen (or any replacement Thomson Reuters page which displays that rate) or an equivalent interest rate should LIBOR cease to be published. |
| Non-Leased Assets | Mean Assets which have not been transferred to EDNSO but remain with EDNAO and are used purposely for the Company's mandated electricity supply operations |
| Suitable Ghanaian Sovereign Bonds | Means outstanding bonds that are not Five-year Ghanaian Sovereign Bonds but are similar Dollar-denominated bonds issued by the Republic of Ghana, including locally issued Dollar-denominated bonds. |



ABBREVIATIONS

| | |
|----------|---|
| EDNSO | Electricity Distribution Network System Operator |
| LNAssets | Legacy Assets transferred to EDNSO as defined in the Lease and Assignment Agreement Section 2.1 |
| NLAssets | Non-Leased Assets of EDNAO |



EQUATION PARAMETERS

| | |
|--|---|
| Capital Expenses (EDNAO) | As calculated pursuant to Section 1.8.3 |
| Corporate Tax (EDNAO) | As calculated pursuant to Section 1.7 |
| Cost of Debt (EDNAO) | As calculated pursuant to Section 1.9.1 |
| Cost of Equity (EDNAO) | As calculated pursuant to Section 1.9.2 |
| Depreciation (EDNAO) | As calculated pursuant to Section 1.8.4 |
| Depreciation on Regulated Asset Base (LNAssets) | As calculated pursuant to Section 1.4 |
| Depreciation on Regulated Asset Base (NLAssets) | As calculated pursuant to Section 1.5 |
| Disposition Proceeds (EDNAO) | As calculated pursuant to Section 1.8.5 |
| Mid-Year Regulated Asset Base (EDNAO) | As calculated pursuant to Section 1.8.6 |
| Opening Regulated Asset Base (EDNAO) | As calculated pursuant to Section 1.8.1 |
| Operating Expenses (EDNAO) | As calculated pursuant to Section 1.2 |
| Return on Debt | As calculated pursuant to Section 1.8 |
| Return on Regulated Asset Base (LNAssets) | As calculated pursuant to Section 1.3 |
| Return on Regulated Asset Base (NLAssets) | As calculated pursuant to Section 1.6 |

Interpretation

This Volume shall be interpreted in accordance with Volume 1; and Capitalized terms used but not defined shall have the meanings assigned in Volume 1.



ANNUAL REVENUE REQUIREMENT FOR ELECTRICITY DISTRIBUTION NETWORK ASSET OWNER (EDNAO)

1.1 Calculation of Annual Revenue Requirement

The Annual Revenue Requirement for EDNAO shall be estimated as of each Major Tariff Review Determination Date in accordance with the following formula:

$$ARR(EDNAO)_t = OpEx(EDNAO)_t + [RtnRAB(LNAssets)_t + DepRAB(LNAssets)_t] + [(RtnRAB(NLAssets)_t + DepRAB(NLAssets)_t)] + (CorpTax)_t$$

Where:

| | |
|----------------------|---|
| $ARR(EDNAO)_t$ | means the Annual Revenue Requirement (EDNAO) for Regulatory Year 't', stated in nominal US Dollars; |
| $OpEx(EDNAO)_t$ | means the Operating Expenses (EDNAO) for Regulatory Year 't' calculated in accordance with Section 1.2; |
| $RtnRAB(LNAssets)_t$ | means the Return on Regulated Asset Base (Leased Assets) for Regulatory Year 't' calculated in accordance with Section 1.3; |
| $DepRAB(LNAssets)_t$ | means the Depreciation on Regulated Asset Base (Leased Assets) for Regulatory Year 't' calculated in accordance with Section 1.4; |
| $RtnRAB(NLAssets)_t$ | means the Return on Regulated Asset Base (Non-Leased Assets) for Regulatory Year 't' calculated in accordance with Section 1.5; |
| $DepRAB(NLAssets)_t$ | means the Depreciation on Regulated Asset Base (Non-Leased Assets) for Regulatory Year 't' calculated in accordance with Section 1.6; |
| $CorpTax(EDNAO)_t$ | means the Corporate Taxes (EDNAO) for Regulatory Year 't' calculated in accordance with Section 1.6; |

1.2 Operating Expenses (EDNAO) for Regulatory Control Periods

The Operating Expenses (EDNAO) in respect of a Regulatory Year (Regulatory Year 't') occurring during a Regulatory Control Period filed by the EDNAO shall equal a projection of all efficient and prudent costs approved by PURC in connection with provision of services by EDNAO during Regulatory Year 't' and shall comprise the following expenses.

- i. Staff and Related Expenses
- ii. General and Administrative Expenses
- iii. Any other Expenses which have been determined by PURC as relevant and appropriate to performance of the roles and responsibilities of an EDNAO

as set forth in the relevant Major Tariff Review Decision, stated in nominal US Dollars, with any Cedi component of such amount stated in nominal Cedi and converted to US Dollars using the relevant projected Exchange Rate (Dollars) provided in the Major Tariff Review Decision.



1.2.1 OpEx(EDNAO Staff Cost)

In determination of EDNAO Staff cost, PURC shall give due consideration to Government’s Employment Protection Policy in respect of staff who remain with the EDNAO under agreed terms and conditions to an EDNAO in a Major Tariff Review with respect to prudent staff costs approved by PURC.

1.3 Return on RAB (LNAssets)

The Return on Leased Network Regulated Asset Base (LNAssets) for a Regulatory Year (Regulatory Year ‘t’) shall be calculated as follows:

$$RtnRAB(LNAssets)_t = MidYearRAB((LNAssets)_t * WACC_t$$

Where:

$RtnRAB(LNAssets)_t$ means the Return on Leased Network Regulated Asset Base (LNAssets) for Regulatory Year ‘t’;

$MidYearRAB(LNAssets)_t$ means the Mid-Year Leased Network Regulated Asset Base (LNAssets) for Regulatory Year ‘t’ calculated pursuant to Section 1.8.6;

$WACC_t$ means the Weighted Average Cost of Capital for Regulatory Year ‘t’, calculated pursuant to Section 1.9.

1.4 Depreciation on RAB (LNAssets)

The Depreciation on Leased Network Regulated Asset Base (LNAssets) shall be calculated using the straight line method of depreciation/amortisation using the principles set forth in Appendix 1. The Depreciation on Non-Leased Network Regulated Asset Base (LNAssets) in respect of a Regulatory Year (Regulatory Year ‘t’) shall equal the depreciation the EDNAO will recognize and approved by PURC during Regulatory Year ‘t’ with respect to the Opening Non-Leased Network Regulated Asset Base (LNAssets), consistently applied, stated in nominal US Dollars.

1.5 Return on RAB (NLAssets)

The Return on Non-Leased Regulatory Asset Base (NLAssets) for a Regulatory Year (Regulatory Year ‘t’) shall be calculated as follows:

$$RtnRAB(NLAssets)_t = MidYearRAB(NLAssets)_t * WACC_t$$

Where:

$RtnRAB(NLAssets)_t$ means the Return on Non-Leased Regulated Asset Base (EDNAO) for Regulatory Year ‘t’;

$MidYearRAB(NLAssets)_t$ means the Mid-Year Non-Leased Regulated Asset Base (EDNAO) for Regulatory Year ‘t’ calculated pursuant to Section 1.8.6;

$WACC_t$ means the Weighted Average Cost of Capital for Regulatory Year ‘t’, calculated pursuant to Section 1.9.



1.6 Depreciation on RAB (NLAssets)

The Depreciation on Non-Leased Regulated Asset Base (NLAssets) shall be calculated using the straight line method of depreciation/amortisation using the principles set forth in Appendix 1. The Depreciation on Non-Leased Regulated Asset Base (NLAssets) in respect of a Regulatory Year (Regulatory Year ‘t’) shall equal the depreciation the EDNAO will recognize and approved by PURC during Regulatory Year ‘t’ with respect to the Opening Non-Leased Regulated Asset Base (NLAssets), consistently applied, stated in nominal US Dollars.

1.7 Corporate Tax (EDNAO)

Corporate Tax (EDNAO), if any, on the EDNAO business shall be treated as expense and shall be recoverable from consumers through tariff. The corporate tax actually payable or paid shall be included in the Annual Revenue Requirement (EDNAO) in accordance with the provisions of Applicable Tax Laws.

1.8 Regulated Asset Base (EDNAO)

All EDNAO’s Assets shall be based on revalued cost.

1.8.1 Opening RAB for first Regulatory Year in a Regulatory Control Period

The EDNAO shall provide detailed information for determination and filing of the initial Regulated Asset Base (EDNAO) for the Regulatory Control period for determination and approval by PURC.

The roll-forward for the Regulatory Asset Base (EDNAO) shall be subject to a prudence test by PURC. The following formula shall be used to roll-forward the Regulatory Asset Base (EDNAO) from the opening value for the first year of the previous Regulatory Period:

$$\text{OpeningRAB (EDNAO)}_t = \text{OpeningRAB (EDNAO)}_{t-1} + \text{ActCapEx(EDNAO)}_{t-1} - \text{ActDep(EDNAO)}_{t-1} - \text{ActDisp(EDNAO)}_{t-1}$$

Where:

Opening RAB(EDNAO)_t means the Opening Regulated Asset Base (EDNAO) for Regulatory Year ‘t’;

Opening RAB(EDNAO)_{t-1} means the Opening Regulated Asset Base (EDNAO) for Regulatory Year ‘t-1’;

ActCapEx(EDNAO)_{t-1} means the actual Capital Expenses (EDNAO) for Regulatory Year ‘t-1’, subject to a prudence test by PURC if actual Capital Expenses (EDNAO) exceeds the approved Capital Expenses (EDNAO) for such Regulatory Year, calculated in accordance with Section 1.8.3;

ActDep(EDNAO)_{t-1} means the actual Depreciation (EDNAO) for Regulatory Year ‘t-1’, calculated in accordance with Section 1.8.4; and

ActDisp(EDNAO)_{t-1} means the actual Disposition Proceeds (EDNAO) for Regulatory Year ‘t-1’, calculated in accordance with Section 1.8.5;

1.8.2 Opening RAB (EDNAO) for Subsequent Regulatory Years

The Opening Regulatory Asset Base (EDNAO) for each subsequent Regulatory Year ‘t’ occurring during a Regulatory Control Period shall be calculated as follows:



$$\text{OpeningRAB(EDNAO)}_t = \text{OpeningRAB(EDNAO)}_{t-1} + \text{CapEx(EDNAO)}_{t-1} - \text{Dep(EDNAO)}_{t-1} - \text{Disp(EDNAO)}_{t-1}$$

Where:

- $\text{Opening RAB(EDNAO)}_t$ means the Opening Regulated Asset Base (EDNAO) for Regulatory Year ‘t’;
- $\text{Opening RAB(EDNAO)}_{t-1}$ means the Opening Regulated Asset Base (EDNAO) for Regulatory Year ‘t-1’;
- $\text{CapEx(EDNAO)}_{t-1}$ means the approved Capital Expenses (EDNAO) for Regulatory Year ‘t-1’, calculated in accordance with Section 1.8.3;
- Dep(EDNAO)_{t-1} means the Depreciation (EDNAO) for Regulatory Year ‘t-1’, calculated in accordance with Section 1.8.4; and
- Disp(EDNAO)_{t-1} means the Disposition Proceeds for Regulatory Year ‘t-1’, calculated in accordance with Section 1.8.5.

1.8.3 Capital Expense (EDNAO)

Capital Expenses (EDNAO) for each Regulatory Year occurring during subsequent Regulatory Control Period shall equal the amount approved by PURC pursuant to the relevant Major Tariff Review Decision, stated in nominal US Dollars, with any Cedi component of such amount stated in nominal Cedi and converted to US Dollars using the relevant projected Exchange Rate (Dollars) set forth in the Major Tariff Review Decision. Capital Expenses (EDNAO) in respect of a project shall be recognized at the time of commissioning and shall include capitalized interest.

1.8.4 Depreciation (EDNAO)

Depreciation (EDNAO) for each Regulatory Year (Regulatory Year ‘t’) shall equal that amount of depreciation the EDNAO will recognize during Regulatory Year ‘t’ with respect to the Regulated Asset Base (EDNAO), calculated using the principles set forth in Section 1.8, consistently applied, stated in nominal US Dollars.

1.8.5 Disposition Proceeds (EDNAO)

Disposition Proceeds (EDNAO) for each Regulatory Year (Regulatory Year ‘t’) shall equal the proceeds realized by the EDNAO from the sale of any assets that are no longer useful in connection with the provisions of operations of EDNAO, stated in nominal US Dollars, with any Cedi component of such amount stated in nominal Cedi and converted to US Dollars using the Exchange Rate (Dollars) determined as of the relevant Major Tariff Review Determination Date.

1.8.6 Mid-Year Regulated Asset Base (EDNAO)

The Mid-Year Regulated Asset Base (EDNAO) as of the mid-point of each Regulatory Year shall be calculated as follows:

$$\text{MidYearRAB(EDNAO)}_t = \text{OpeningRAB(EDNAO)}_t + 0.5(\text{CapEx(EDNAO)}_t - \text{Dep(EDNAO)}_t - \text{Disp(EDNAO)}_t)$$

Where:

- $\text{MidYearRAB(EDNAO)}_t$ means the Mid-Year Regulated Asset Base (EDNAO) for Regulatory Year ‘t’;



| | |
|--------------------------------|---|
| OpeningRAB(EDNAO) _t | means the Opening Regulated Asset Base (EDNAO) for Regulatory Year ‘t’; |
| CapEx(EDNAO) _t | means the Capital Expenses (EDNAO) for Regulatory Year ‘t’, calculated in accordance with Section 1.8.3; |
| Dep(EDNAO) _t | means the Depreciation (EDNAO) for Regulatory Year ‘t’, calculated in accordance with Section 1.8.4; and |
| Disp(EDNAO) _t | means the Disposition Proceeds (EDNAO) for Regulatory Year ‘t’, calculated in accordance with Section 1.8.5 |

1.9 Weighted Average Cost of Capital

The Weighted Average Cost of Capital for a Regulatory Year (Regulatory Year ‘t’) shall be calculated as follows:

| | |
|-------------------|---|
| Where: | $WACC = (E * R_e) + (D * R_{d,t})$ |
| WACC _t | means the Weighted Average Cost of Capital for Regulatory Year ‘t’; |
| E | means 0.3; |
| R _e | means the Equity Yield, which is equal to [●]% as determined using the formula stated in Section 1.9.2 of this Volume (Volume 3); |
| D | means 0.7; and |
| R _{d,t} | means the Return on Debt calculated in respect of Regulatory Year ‘t’ using the principles set forth in Section 1.9.1 below. |

1.9.1 Determination of Cost of Debt

The Return on Debt for a Regulatory Year (Regulatory Year ‘t’) that is in Regulatory Control Period ‘1’ shall be the Debt Margin of [●]% plus LIBOR prevailing on the date that occurs 10 Business Days prior to the date of the relevant Major Tariff Review Proposal submitted by the Company.

The Return on Debt for a Regulatory Year (Regulatory Year ‘t’) that is not in Regulatory Control Period ‘1’ shall equal:

- (a) in the event that there exists Five-year Ghanaian Sovereign Bonds, the yield to maturity for such Five-year Ghanaian Sovereign Bonds as reported by Bloomberg or a similar financial service;
- (b) in the event that no Five-year Ghanaian Sovereign Bonds are outstanding, but Suitable Ghanaian Sovereign Bonds are outstanding, the yield to maturity that an investor could earn by purchasing such Suitable Ghanaian Sovereign Bonds as reported by Bloomberg or a similar financial service, with appropriate adjustments;
- (c) in the event that no Five-year Ghanaian Sovereign Bonds or Suitable Ghanaian Sovereign Bonds are outstanding, but the Republic of Ghana has a Ghanaian Credit Rating, then the average



maturity that an investor could earn by purchasing Dollar-denominated bonds issued by five similar countries with the same credit rating as the Ghanaian Credit Rating; or

- (d) in the event that no 5-year Ghanaian Sovereign Bonds, Suitable Ghanaian Sovereign Bonds, or Ghanaian Credit Rating are outstanding or available, then the average yield to maturity that an investor could earn by purchasing Dollar-denominated bonds issued by five countries with economies that have characteristics that are similar to the economy of the Republic of Ghana.

1.9.2 Determination of Cost of Equity

In computing Cost of equity for EDNAO, PURC shall adopt any of the following methodologies.

1.9.2.1 Methodology-1 Classical Capital Asset Pricing Model Approach

$$R_e = R_{rf} + B_i * (R_{mi} - (R_{rf} + R_c) + R_{rf})$$

Where:

R_{rf} is Ghana Risk Free Rate (Ghana Government 5-Year Eurobond Rate)

B_i is Unlevered Global Electricity Distribution Utility Asset Beta in relation to US Market Index

R_{mi} is Ghana Market Return defined as $(R_m + R_{rf})$

R_m is Ghana Equity Market Risk Premium

R_c is Ghana Country Risk Premium = $(R_{rf} - R_{US})$

R_{US} is US Risk Free Rate (5-Year US Treasury Note Rate)

R_{usc} is US Country Risk Premium

R_{usm} is US Market Return

1.9.2.2 Methodology-2 Modified Classical Capital Asset Pricing Model

$$R_e = R_{rfG} + (R_m - R_{rfG}) * B$$

Where

R_e = Required Rate of Return on Equity

R_{rfG} = Ghana Government Risk Free Rate (5-Year EuroBond Rate)

$R_m - R_{rfG}$ = Ghana's Equity Market Risk Premium

B = Global Electricity Distribution Utility Asset Beta in relation to US Market Index

1.9.2.3 Methodology-3 Country Risk to Corporate Risk Premium Approach

The Assumption underpinning methodology-3 is that Electricity Distribution Utilities in Ghana like any other Corporate Entity in the country are equally exposed to Ghana's Country Risk, hence the need to use all variables which are considered in determining Ghana's Country Risk Premium

$$E(R) = R_f + CS + Beta * (USP)$$

Where:

R_f = Ghana's Risk Free Rate (Ghana 5-Year Eurobond Rate)

CS = Ghana's Country Default Spread

$Beta$ = Global Electricity Distribution Utility Asset Beta in relation to US Market Index

USP = US Premium



1.9.2.4 Risk Free Rate

In consonance with general practice, PURC shall adopt the yield on Ghana Government 5-year Eurobond Debt instrument as the risk free rate.

1.9.2.5 Equity Beta

PURC shall for purposes of computing Cost of Equity, adopt Benchmark Asset Beta as established for Global Electricity Distribution Utilities under Incentive-Based Regulation as the Equity Beta. This Benchmark Asset Beta shall be re-levered using Hamada Conversion Methodology, which shall be used in computing the Equity Beta as per the following formula:

$$\beta_L = \beta_U * [1 + (1-T)D/E]$$

Where:

| | |
|-----------|-----------------------------|
| β_L | Levered Beta (Equity Beta) |
| β_U | Unlevered Beta (Asset Beta) |
| T | Corporate Tax |
| D | Market Value of Debt |
| E | Market Value of Equity |

1.9.2.6 Ghana Market Return

In determining Market Return for Ghana, PURC shall adopt Ghana's Market Return data as published by an Independent International Rating Agency (Moody's) or financial market reporting Company such as Bloomberg or a similar service.

1.9.2.7 Ghana Market Risk Premium

To determine Market Risk Premium for Ghana PURC shall adopt Ghana's Market Risk Premium data as published by an Independent International Rating Agency (for example Moody's) or financial market reporting Company such as Bloomberg or a similar service.

1.9.2.8 Ghana Country Risk Premium

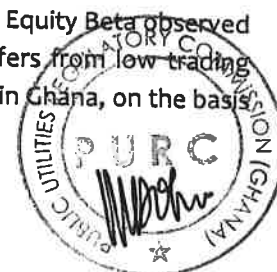
To determine Country Risk Premium for Ghana, PURC shall adopt Country Risk Premium data for Ghana as published by an Independent International Rating Agency (for example Moody's) or financial market reporting Company such as Bloomberg or a similar service.

1.9.2.9 Ghana Country Default Spread

In determining Country Default Spread for Ghana PURC shall draw on Ghana's Country Default Spread as published by an Independent International Rating Agency (for example Moody's) or financial market reporting Company such as Bloomberg or a similar service.

1.9.2.10 Electricity Distribution Utility Asset Beta

In practice, Asset Beta for a business would normally be derived from assessment of Equity Beta observed within a Country's Local Equity Market. However, since Ghana's Equity Market suffers from low trading volumes, PURC shall determine Asset Beta for Electricity Distribution Utility business in Ghana, on the basis



of Asset Betas of comparable overseas electricity utility business. In line with foregoing, Asset Beta of 0.35 - 0.50 as established for Electricity Distribution Utilities under Incentive-Based Regulation shall be employed.

1.10 Lease Payments (EDNAO)

The Lease Payments filed by the EDNAO shall equal amount determined by PURC and in conformity with the formula stated in Section 1.9 of Volume 2 as follows:

$$LP_t = RtnRNLFA_t + DepRNLFA_t$$

Where:

- LP_t means the Lease Payments for Regulatory Year 't', stated in nominal US Dollars;
- $RtnRNLFA_t$ means the Return on Revalued Net Leased (Legacy) Fixed Assets for Regulatory Year 't';
- $DepRNLFA_t$ means the Depreciation on Revalued Net Leased (Legacy) Fixed Assets for Regulatory Year 't';

The lease payment shall be passed through the electricity distribution and supply overall revenue requirement and collected by the EDNSO as a pass-through cost and pay same to the EDNAO.

1.11 Adjustment in Annual Revenue Requirement (EDNAO)

In order to effect any adjustment, the EDNAO shall be required to provide in their Annual Report estimates of the following components of the Annual Revenue Requirement (EDNAO) adjusted for variations from the assumptions of exchange rates, changes in CPI, and increases in wages and salaries used in deriving the original estimated efficient and prudent costs for that Regulatory Year:

- the efficient and prudent Operating Expenses (EDNAO) for Regulatory Year 't-2';
- for the second and subsequent Regulatory Periods, the efficient and prudent Capital Expenses (EDNAO) for Regulatory Year 't-2';
- the efficient and prudent Depreciation (EDNAO) on Regulated Asset Base (EDNAO) recognized by EDNAO during Regulatory Year 't-2';
- the Corporate Tax (EDNAO) based on the efficient and prudent costs above for Regulatory Year 't-2';



1.12 APPENDIX - Principles for Accounting for Depreciation

The Depreciation on Regulated Asset Base shall be calculated using the straight line method of depreciation/amortisation and the following useful asset life and depreciation rates.

| Category | Description | Useful Life | Depreciation Rate |
|-------------------|--------------------------------------|-------------|-------------------|
| Sub-Transmission | Land | 0 | |
| Sub-Transmission | Structures | 40 | 2.50 |
| Sub-Transmission | 33/11kV Underground Cables | 40 | 2.50 |
| Sub-Transmission | 33/11kV Transformers | 40 | 2.50 |
| Sub-Transmission | 33/11kV Overhead Lines/Wood Poles | 20 | 5.00 |
| Sub-Transmission | 33/11kV Overhead Lines/Steel Tower | 40 | 2.50 |
| Sub-Transmission | Electrical Equipment | 25 | 4.00 |
| Distribution | Land | 0 | |
| Distribution | Structures | 40 | 2.50 |
| Distribution | 11kV Underground Cables | 40 | 2.50 |
| Distribution | LV Underground Cables | 30 | 3.33 |
| Distribution | 33kV/LV Transformers | 30 | 3.33 |
| Distribution | 11kV/LV Transformers | 30 | 3.33 |
| Distribution | 11kV Overhead Lines/Wood Poles | 20 | 5.00 |
| Distribution | 11kV Overhead Lines/Steel Towers | 35 | 2.86 |
| Distribution | LV Overhead Lines | 25 | 4.00 |
| Distribution | LV Service Connections/UGC | 30 | 3.33 |
| Distribution | LV Service Connections/OHL | 25 | 4.00 |
| Distribution | Electrical Equipment | 25 | 4.00 |
| Buildings | Land | 0 | |
| Buildings | Structures | 40 | 2.50 |
| General Tools | Workshop Tools | 8 | 12.50 |
| General Tools | Instruments & Test Equipment | 8 | 12.50 |
| Fixtures/Fittings | Fixtures & Equipment | 8 | 12.50 |
| Fixtures/Fittings | Office Machines | 8 | 12.50 |
| Fixtures/Fittings | Computers and Accessories | 4 | 25.00 |
| Fixtures/Fittings | Computers & Access/Mainframe, Server | 5 | 20.00 |
| Meters | Credit Meters | 20 | 5.00 |
| Meters | Prepayment Meters | 10 | 10.00 |
| Transport | Light Vehicles | 4 | 25.00 |
| Transport | Heavy Duty Vehicles | 5 | 20.00 |
| Transport | Specialised Vehicles | 10 | 10.00 |
| Computer Software | Persopay and HR | 3 | 33.33 |
| Computer Software | SunSystems | 3 | 33.33 |
| Computer Software | Local Area Network | 3 | 33.33 |

