



# **CYPRUS ENERGY REGULATORY AUTHORITY (CERA)**

THE LAWS ON REGULATING THE ELECTRICITY  
MARKET OF 2003 TO 2012, N. 122(I)/2003 TO N.  
211(I)/2012

**REGULATORY DECISION NO 02/2015**

## **Statement on Regulatory Practice and Methodology of Electricity Tariffs**

Unofficial Translation



## Table of Contents

<b>1</b>	<b>Preamble</b>	<b>1</b>
<b>2</b>	<b>Definitions</b>	<b>1</b>
<b>3</b>	<b>Introduction</b>	<b>2</b>
<b>4</b>	<b>Tariff regulation framework</b>	<b>3</b>
<b>5</b>	<b>Objectives of regulating electricity tariffs</b>	<b>6</b>
<b>6</b>	<b>Allowed revenues</b>	<b>7</b>
<b>7</b>	<b>General structure of electricity tariffs</b>	<b>8</b>
<b>8</b>	<b>Tariff methodology</b>	<b>10</b>
	<b>Appendix 1: Principles of Regulatory Asset Value Base (RAVB)</b>	<b>25</b>
	<b>Appendix 2: Methodology of Calculating the Weighted Average Cost of Capital (WACC) for the Generation, Transmission and Distribution Activities</b>	<b>33</b>
	<b>Appendix 3: Operating Component of Allowed Revenues</b>	<b>37</b>
	<b>Appendix 4: Tariff Parameters</b>	<b>45</b>



# 1 Preamble

- 1.1 The Cyprus Energy Regulatory Authority (CERA), exercising the powers provided by Articles 24, 25, 26(1), 31, 32, 34 and 108 of the Law on Regulating the Electricity Market of 2003 and the subsequent amendments (the ‘Law’) and Regulations 2 and 4 of the Regulating the Electricity Market (Procedures for Charging Electricity Tariffs) Regulations of 2004, Regulations 472/2004, and taking into consideration the comments received after the Draft Statement on Regulatory Practice and Methodology of Electricity Tariffs was made public, is issuing the following decision. The present Statement on Regulatory Practice and Methodology of Electricity Tariffs abolishes the Statement on Regulatory Practice and Methodology of Electricity Tariffs, Regulations REG 177/2006, 404/2006, 105/2007, 227/2007, 537/2010.

# 2 Definitions

- 2.1 For the purposes of this regulation the following definitions shall apply:
- a. ‘short run marginal cost’ is the marginal cost for a short period of time during which only the operating expenditure may vary because it is not considered feasible to carry out an investment and therefore the fixed assets are deemed to be stable;
  - b. ‘distribution system operation means the activity related to the management and operation of the distribution system;
  - c. ‘transmission system operation means the activity related to the management and operation of the transmission network including managing system frequency, managing voltage, managing congestion and coordinating planning and maintenance of the transmission network;
  - d. ‘imbalance settlement’ is the process by which the wholesale power market participants pay or are paid for the differences between their measured and commissioned electricity production or consumption on a half hourly basis;
  - e. ‘ancillary services and long run reserves’ are a range of services that the Cyprus Transmission System Operator (TSOC) procures to manage the transmission system, including black start, voltage control, operating reserves, normal frequency control and long run reserve;
  - f. ‘distribution system ownership’ means the activity of financing, constructing and maintaining the distribution network;;
  - g. ‘transmission system ownership’ means the activity of financing, developing and maintaining the transmission network;

- h. the pool is a centrally organised wholesale market on the day ahead of delivery and/or on the day of delivery through which power is bought and sold by generators and suppliers;
- i. 'long run marginal cost' means the change in total cost corresponding to a small change in quantity sustained over a long period of time;
- j. 'balancing mechanism' is a centrally organised market through which the Transmission System Operator may buy and sell electricity from participants in the wholesale electricity market so as to manage the transmission system;;
- k. 'WACC' means the weighted average cost of capital which corresponds to the weighted average cost of the funding sources of a business;
- l. 'economic efficiency' means the maximisation of social welfare over time, which includes concepts such as allocative efficiency whereby there is an optimal allocation of goods and services and productive efficiency whereby no further outputs of goods and services can be achieved for a given set of inputs;
- m. 'marginal cost' means the change in total cost corresponding to a small change in the quantity of generation, demand, use of the network, etc.;
- n. 'supply' has the meaning given to that term by the Law;
- o. 'CERA' means the Cyprus Energy Regulatory Authority, which *inter alia* is responsible for economic regulation of activities within the electricity sector;
- p. 'RAVB' means the regulated asset value base, being the net book value of the regulated assets of an organisation used solely for the provision of regulated services;
- q. 'distribution system' has the meaning given to that term by the Law; and
- r. 'transmission system' has the meaning given to that term by the Law.

### 3 Introduction

3.1 The electricity market in Cyprus has been organised into separate licensed activities as follows:

- a. The activity of electricity generation, which is a competitive activity with freedom of entry, subject to CERA granting the relevant license. Electricity generation by a dominant firm shall be regulated in order to protect consumers and facilitate entry until such time as CERA decides that regulation is no longer appropriate.
- b. The activity of transmission system ownership shall be a regulated monopoly activity.
- c. The activity of transmission system operation shall be a regulated monopoly activity.

#### Introduction

- d. The activity of distribution system ownership shall be a regulated monopoly activity.
- e. The activity of distribution system operation shall be a regulated monopoly activity.
- f. The activity of supply of electricity is a competitive activity. All customers shall be eligible to choose their supplier and there shall be freedom of entry into supply, subject to CERA granting the relevant license. Supply by a dominant firm shall be regulated in order to protect the interests of consumers and facilitate entry into the market until such time as CERA decides that regulation is no longer appropriate. Supply by any supplier is regulated regarding the way in which certain charges levied on the supplier are passed through to consumers and the way in which information is presented on an end consumer bill.

3.2 The purpose of this Statement on Regulatory Practice and Electricity Tariff Methodology is to set out:

- a. how CERA shall determine allowed revenues for each regulated activity; and
- b. how regulated tariffs shall be set.

## 4 Tariff regulation framework

4.1 The Statement on Regulatory Practice and Electricity Tariff Methodology has been designed in accordance with the following documents:

- a. Directive 2009/72/EC of the European Parliament and of the Council;
- b. Council Recommendation of 27 October 1981 on Electricity Tariff Structures in the Community (81/924/EEC);
- c. The Laws on Regulating the Electricity Market of 2003 to 2012 (N.122(I)/2003-N.211(I)/2012) as amended;
- d. Regulating the Electricity Market (Procedures for Charging Electricity Tariffs) Regulations of 2004, REF.472/2004;
- e. Directive 2012/27/EC on Energy Efficiency; and
- f. The Citizen's Energy Forum document on good practice in energy billing (MEMO/09/429);
- g. The Energy Efficiency in End-Use and Energy Services Laws of 2009 and 2012 and their amendments (Law 31(I)/2009, Law 53(I)/2012);
- h. The Promotion of Electricity and Combined Heat and Power Law of 2006 (Law 174(I)/2006).

[Directive 2009/72/EC](#)

4.2 Directive 2009/72/EC concerns common rules for the internal market in electricity and repeals Directive 2003/54/EC.

4.3 The Directive requires, inter alia, that:

- a. Member States ensure the implementation of a system of third party access to the transmission and distribution systems based on published tariffs and applied objectively and without discrimination;
- b. The regulatory authority be responsible for fixing or approving in advance of their entry into force transmission and distribution tariffs or methodologies that allow the necessary investments to be carried out so as to ensure the viability of the transmission and distribution networks; and
- c. Member States create appropriate and efficient mechanisms for regulation, control and transparency so as to avoid any abuse of a dominant position.

### Council Recommendation (81/924/EEC)

4.4 Council Recommendation (81/924/EEC) concerns the structure of tariffs for regulated activities. The Council recommends that, inter alia, tariff structures reflect the costs incurred in supplying the various categories of customers, avoid unjustifiable consumption and be as clear and simple as possible.

### Law on Regulating the Electricity Market of 2003 (N.122(I)/2003) until 2012

4.5 The Law on Regulating the Electricity Market of 2003 to 2012 transposes Directive 2009/72/EC into national law.

4.6 Law N.122(I)/2003 to 2012 provides that :

- a. methodologies for providing access to and charging for using the transmission and distribution systems are established, are approved by CERA and published as per CERA's requirements;
- b. electricity market rules are established and approved by CERA and the Minister of Energy, Commerce, Industry and Tourism;
- c. tariffs and charges applied by the licensees for any services provided in the market are regulated in accordance with the terms of their license;
- d. tariffs and charges for services provided in the market be cost reflective and non-discriminatory;
- e. all expenses reasonably and efficiently incurred in the conduct of license related activities are recovered by the licensee, including inter alia:
  - i. fuel, salaries and other operating and maintenance expenses;
  - ii. depreciation expenses;
  - iii. a reasonable return on capital employed;

### Tariff regulation framework



- iv. expenses that arise from public service obligations imposed upon the licensee; and
- v. expenses arising from the offer of ancillary services.

In determining the proper level of tariffs and charges, CERA in addition to the actual cost and reasonable return of the undertaking, must take into consideration the interests of consumers and their protection against monopoly prices as well as promote energy efficiency and quality of the services provided by the licencees.

### Regulating the Electricity Market (Procedures for Charging Electricity Tariffs) Regulations of 2004, REG.472/2004

- 4.7 Regulating the Electricity Market (Procedures for Charging Electricity Tariffs) Regulations of 2004, REG.472/2004, concerns the procedures to be adhered to and deliberations to be undertaken in order to define the tariffs and charges of the undertakings/licencees active in the electricity market.

### Directive 2012/27/EU on Energy Efficiency

- 4.8 Directive 2012/27/EU establishes a common framework of measures for the promotion of energy efficiency, including requirements for billing information to be provided to final customers.
- 4.9 Articles 9, 10 and 11 and Annexe VII of the Directive cover, *inter alia*, issues regarding the metering and billing of individual consumption.

Specifically with respect to tariffs, according to Article 15:

- a. Incentives for transmission and distribution tariffs which are detrimental to the overall efficiency (including energy efficiency) of the electricity generation system, or those which might hinder the contribution of demand response in the balancing mechanism of the electricity market as well as the provision of ancillary services are abolished.
- b. The tariffs provide suppliers with the ability to improve consumer participation in system efficiency, including the demand response mechanism of the electricity market depending on the national prevailing conditions..
- c. The regulation and the system tariffs fulfil the energy efficiency criteria of Annexe XI, taking into consideration the guidelines and codes drawn up in accordance with Regulation (EC) no 714/2009.

- 4.10 The Citizen's Energy Forum documents on good practice in energy billing (MEMO/09/429 and IP/09/1418) set out recommendations for the format of good electricity bills for consumers, including that inter alia:
- a. bills must be easily understandable; and
  - b. bills should allow consumers to compare supplier offers.

## 5 Objectives of regulating electricity tariffs

- 5.1 The overarching objectives of tariff regulation are to maximise the long term competitiveness of the Cypriot economy, protect the interests of consumers in the short and long term against prices established on a monopoly basis, meet public service obligations, safeguard the security of electricity supply and promote energy efficient and quality of the services provided by the licencees. The tariffs are determined on the basis of a methodical and consistent application of the principles set out in the methodology; and the proposals and decisions about tariffs are evidence-based and are formulated after thorough consultation with the parties concerned.
- 5.2 More specific objectives of regulated tariffs are that they:
- a. reflect the cost of service so as to enhance economic efficiency;
  - b. allow the reasonable prospect of recovery of efficient costs;
  - c. be fair and non-discriminatory unless justified on the grounds of other tariff objectives such as enhancing economic efficiency;
  - d. avoid cross subsidies between different electricity sector activities (i.e. generation, transmission system ownership, transmission system operation, distribution system ownership, distribution system operation and supply);
  - e. be simple, transparent and predictable;
  - f. encourage efficient consumption decisions by consumers;
  - g. be compatible with the clear environmental objectives set by the Republic of Cyprus;
  - h. allow the recovery of efficiently incurred costs related to public service obligations and the promotion of generation of electricity from renewable energy sources and high-efficiency cogeneration;
  - i. encourage security of electricity supply;
  - j. provide incentives to regulated firms to operate efficiently; and
  - k. promote efficiency and quality of the service provided by licencees.

### Objectives of regulating electricity tariffs

## 6 Allowed revenues

- 6.1 CERA shall determine the allowed revenue, in accordance with the periodic regulatory review and in accordance with the objectives set out in paragraph 5.1 and 5.2, for each of the activities of generation by a dominant generator, transmission system ownership, transmission system operation, distribution system ownership, distribution system operation and supply by a dominant supplier.
- 6.2 The regulatory control period for each regulated activity shall be that as set out in Appendix 4.
- 6.3 Prior to the start of each regulatory control period, CERA shall conduct a periodic regulatory review to determine the allowed revenues for each activity for the regulatory control period.
- 6.4 The objective of the periodic regulatory review shall be to incentivise the provider of each regulated activity to reduce controllable costs while allowing the provider of the activity the reasonable prospect of recovering its reasonable costs so as to maintain a viable efficient business. The provider of a regulated activity shall bear the difference between its allowed revenues for a regulatory control period and its actual costs for the regulatory control period, where the difference may be positive or negative, and the difference shall not be carried forward as an adjustment to the allowed revenues of a future regulatory control period except as allowed for in accordance with the K factor adjustment described in paragraph 7.4. The Allowed Revenues arising from non-controllable operational costs (as defined in Appendix 3) shall be adjusted when there are deviations in the forecasted energy or when factors change.
- 6.5 The allowed revenues for each activity listed in paragraph 6.1 with the exception of the supply by a dominant supplier, shall comprise of a capital related component and an operating component, as follows:
  - a. The capital related component of allowed revenue shall include the depreciation of the average Regulated Asset Value Base (RAVB) and the allowed return on the average RAVB. The RAVB shall be determined in accordance with Appendix 1. The allowed rate of return on RAVB shall be the Weighted Average Cost of Capital (WACC), which shall be determined in accordance with Appendix 2.
  - b. The operating component of allowed revenues shall be set in accordance with Appendix 3.
- 6.6 The allowed WACC for an activity shall be determined as part of the periodic regulatory review in accordance with Appendix 2 based on observed data and shall be a nominal rate of return. During the periodic regulatory review, CERA may decide to index the WACC or elements used to determine the WACC such that the WACC varies during the regulatory control period. The objective of such

indexation is to protect the firm undertaking the regulated activity from uncontrollable changes to its cost of financing.

- 6.7 The RAVB for an activity shall also be calculated ex-post at the end of each year in accordance with Appendix 1, and there shall be an ex-post readjustment of the capital part of the allowed revenues based on the year's actual capital expenditures which were included in the RAVB. If the capital expenditures are higher than budgeted, the difference shall be transferred to tariffs only to the extent that CERA considers the increase to be reasonable. The evidence-based readjustment shall be applied to the tariffs of the following year of the regulatory control period and shall readjust the projected capital part of the allowed revenues for the remainder of the regulatory control period.
- 6.8 The operating component of allowed revenues shall be adjusted in accordance with Appendix 3 and, where applicable, in accordance with the fuel price adjustment methodology described in paragraph 8.10.
- 6.9 The allowed revenues for each activity shall take account of customer contributions such that the activity is not over remunerated.
- 6.10 The allowed revenue for the supply by a dominant supplier shall be determined in accordance with paragraph 8.67 and 8.68 in the form of an allowed margin on reasonable business management costs.
- 6.11 CERA reserves the right, when in its opinion there are significant changes in the electricity market during the regulatory control period, to intervene with adjustments and to request changes to the allowed revenues and electricity tariffs (including the tariff structure), with the aim of ensuring the smooth operation of the electricity market under conditions of healthy competition benefiting the consumers as stipulated in the Law.

## **7 General structure of electricity tariffs**

- 7.1 Tariffs for goods or services provided by way of a regulated activity shall be regulated and, for the avoidance of doubt, all tariffs to end consumers that are served by a supplier regulated in accordance with paragraph 3.1(6f) shall be regulated in accordance with the objectives set out in paragraph 5.1 and paragraph 5.2 and the principles set out in paragraph 7.10.
- 7.2 The provider of a regulated product or service shall have in place a tariff that applies to the product or service provided. Prior to the year to which the tariff applies, the provider shall propose the tariff to CERA. CERA shall assess the tariff against the objectives set out in paragraph 5.1 and paragraph 5.2 and shall decide whether to approve the proposal. Assessing the tariff may require a trade-off between two or more objectives.
- 7.3 Regulated tariffs for a year shall be set so as to recover allowed revenues for the year for the regulated generation, transmission system ownership, transmission

### **General structure of electricity tariffs**

system operation, distribution system ownership, distribution system operation and regulated supply activities.

- 7.4 The allowed revenue to be recovered through the regulated network tariffs (T-NH, T-NM, T-NL) and the regulated generation tariff (T-W) shall include an adjustment K factor calculated separately for each tariff on an annual basis to take account of over or under recovery of allowed revenues in the previous year related to reasonable uncontrollable energy demand forecast errors. The adjustment K factor shall be calculated based on the total energy produced in the case of the generation tariff (T-W) and based on the corresponding recorded consumer energy demand in the case of each of the network tariffs (T-NH, T-NM, T-NL). The adjustment K factor may be positive or negative. The adjustment K factor shall include an allowance for interest which is subject to CERA's approval.
- 7.5 The tariff categories shall be set in accordance with Table 1 of this Statement on Regulatory Practice and Methodology of Electricity Tariffs.

**Table 1:** Tariff categories

Tariff	Description
<b>T-W</b>	Wholesale electricity tariff, applied to the sale of electricity by EAC generation (while EAC is a dominant generator) on the one hand, to EAC supply, non-EAC generation and non-EAC supply on the other
<b>T-NH</b>	Use of Transmission System Tariff (36kV and above)
<b>T-NM</b>	Use of Distribution System Tariff (medium voltage: greater than 1kV and less than 36kV), which includes a charge component related to the DSO
<b>T-NL</b>	Use of Distribution System Tariff (low voltage: at or below 1kV), which includes a charge component related to the DSO
<b>T-BM</b>	Tariff for Business Management Services provided to customers (invoicing, etc)
<b>T-AS</b>	Tariff for the provision of Ancillary Services and long term reserve <sup>1</sup>
<b>T-PRC</b>	Tariff for the recovery of expenses of the provision of PSOs, and promoting RES / high-efficiency co-generation systems
<b>T-TSO</b>	Tariff for the recovery of expenses of the Transmission System Operator
<b>T-MET</b>	Tariff for the recovery of expenses of metering incurred by the Distribution System Operator (for users connected to the distribution network)
<b>T-RET</b>	Supply tariffs and electricity market charges to the end consumer

<sup>1</sup> As a result of recent low demand growth, no costs are currently associated with long term reserve. However, in principle the tariff methodology should take account of these costs.

## General structure of electricity tariffs

- 7.6 The following tariffs charged to suppliers shall be regulated: T-AS, T-MET. The following tariff shall be charged to suppliers and shall not be regulated except when levied by a generator regulated in accordance with paragraph 3.1(1a): T-W.
- 7.7 A supplier that is not dominant shall be free to decide how to pass the costs of T-AS, T-MET, and T-W on to end users in accordance with the principles set out in paragraph 7.10.
- 7.8 The following tariffs charged to suppliers shall be regulated and suppliers shall pass through the tariffs to their end consumers: T-NH, T-NM, T-NL, T-PRC, T-TSO.
- 7.9 The following tariffs levied on end consumers shall not be regulated except when levied by a supplier regulated in accordance with paragraph 3.1(6): T-BM, T-RET.
- 7.10 Tariffs to end consumers may differentiate between customer classes according to characteristics that reflect costs but may not differentiate according to the geographical location of the consumer within Cyprus.

## 8 Tariff methodology

- 8.1 The tariff methodology applies to regulated tariffs. All regulated tariffs shall meet the objectives set out in paragraphs 5.2 and, in addition, all tariffs levied on end consumers shall meet the principles set out in paragraph 7.10.
- 8.2 Certain parameters to use in determining tariffs shall be set from time to time by CERA. Initial values for the parameters are set out in Appendix 4.
- 8.3 Regarding tariffs T-NH, T-NM and T-NL the provisions of Annexe XI of Directive 2012/27/EC on energy efficiency shall apply.

### T-W: Wholesale Electricity Tariff

- 8.4 T-W is the wholesale electricity tariff. T-W shall apply to all sales of power by dominant generators with the exception of their power sold through the pool, the balancing mechanism and imbalance settlement, the ancillary services contracts with the TSOC and the long run reserve contracts with the TSOC. For the avoidance of doubt, T-W shall apply to the sale of electricity by all dominant generators to:
- a. their own supply business;
  - b. other suppliers; and
  - c. other generators.
- 8.5 The wholesale electricity tariff T-W shall form the basis for the regulated contracts between a generator with a dominant position and other generators or suppliers since the dominant generator may offer a range of products. The relevant procedures shall be regulated by CERA and different products shall be billed at different prices. The energy supply tariff shall be on the basis of the corresponding T-W.

### Tariff methodology

- 8.6 Except as provided for by paragraph 8.7, T-W shall be set so as to recover the allowed total costs of the regulated generator, less net revenues from ex-ante estimates of sales through the pool, the balancing mechanism and imbalance settlement, the ancillary services contracts with the TSOC and the long run reserve contracts with the TSOC. For the avoidance of doubt any of the elements of net revenues described in this paragraph may be positive or negative.
- 8.7 All of the regulated generator's revenues shall be reviewed by CERA on a regular basis and the relevant ex-post readjustments will be made.
- 8.8 A regulated generator may propose a tariff that is expected to recover less revenue than that provided for by paragraph 8.5. In deciding whether to approve such a proposal, CERA shall consider the effect of the proposed tariff on competition in the markets for generation and supply. In any event, T-W shall not be set below the estimated expected short run marginal generation cost (energy and capacity).
- 8.9 T-W shall be set and published prior to the start of the tariff year and be defined for each half hour of the tariff year according to the following principles:
- a. T-W shall be set so as to recover the Allowable Revenue for the regulated generation activity less any net revenues from sales through the pool, the balancing mechanism and imbalance settlement, the ancillary services and the long run reserve, where net revenues may be positive or negative.
  - b. T-W shall reflect the marginal cost of energy and capacity, with an adjustment to recover allowed revenue of the regulated generation activity except as provided for by paragraph 8.78.
  - c. The marginal cost component of T-W shall be estimated by the regulated generator and comprise the marginal cost of energy and the marginal cost of capacity. The short run marginal cost of energy shall be estimated for each half hour of the following year based on a market simulation of the Cypriot power system, taking into account uncertainty in, e.g., generation availability and demand. The marginal cost of capacity for generation (and voluntary demand side response, if applicable) shall be estimated for a half hour period, taking into consideration the cost of the assets included in the regulated generator's RAVB.
  - d. The adjustment to recover the allowed revenue of the regulated generation activity shall be applied on a uniform basis to generation in all half hours of the year unless the generator to which the tariff applies demonstrates to the satisfaction of CERA that an alternative adjustment whereby the adjustment varies by half hour would better reflect the tariff objectives set out in paragraph 5.2.
  - e. Half hours of the year with a similar marginal cost of energy and capacity shall be grouped, and a uniform marginal cost (volume weighted average marginal cost) applied for such a group of hours. By way of explanation, T-W need not differ for all 17520 half hours within the tariff year and may, for example, differ by

season, day/night, week-day/week-end or public holidays within the year. The tariff proposal shall include the proposed choice of groups of half hours.

- 8.10 CERA may request that the TSOC undertakes a study of the marginal cost of energy and the marginal cost of capacity for the Cypriot power system with the purpose of assisting CERA to review the generator's proposal for T-W.
- 8.11 T-W shall be adjusted at regular intervals within the tariff year according to a fuel price adjustment formula, based on the following:
- a. The objective of the fuel price adjustment formula is to allow the regulated generator to recover the reasonable uncontrollable changes to costs of fuel used by its power stations to generate electricity.
  - b. Prior to the start of the tariff year a base cost for fuel per kWh of generation output shall be determined for regular intervals within the tariff year whereby the base cost is consistent with the marginal cost study used to set T-W.
  - c. T-W shall be adjusted to reflect the difference between actual cost for fuel per kWh of generation output and the base cost for fuel per kWh of generation output.
- 8.12 The fuel price adjustment shall apply to the energy component of T-W.
- 8.13 Prior to the start of the tariff year, the regulated generator shall propose the fuel price adjustment formula to apply to the tariff year. CERA shall review and decide whether to approve or reject the fuel price adjustment formula.
- 8.14 The K factor adjustment for T-W shall be determined by CERA and is intended to protect the regulated generator and the electricity consumers from the revenue effect of uncontrollable errors in the forecast exported energy to the transmission system while avoiding distorted incentives to sell through T-W or through the pool.
- 8.15 No K factor adjustment shall be made in favour of the regulated generator to the extent the difference between the forecast and actual total generation in the wholesale market or the volume of sales through T-W or outside T-W was the result of market manipulation.

#### T-NH: Use of Transmission System Tariff

- 8.16 T-NH is the use of transmission system tariff and shall apply in respect of all loads on the Cyprus electricity network. T-NH shall be set so as to recover the allowed total revenues of the transmission owner, excluding connection revenues, other customer contributions and costs related to the transmission system operator (TSOC), as well as the cost of ancillary services relating to the Transmission Network such as voltage regulation.
- 8.17 T-NH shall be applied to a supplier as a charge related to each of the supplier's end consumers. The supplier shall apply the same charge to its end consumers.

#### Tariff methodology



- The charges that the suppliers apply to the end consumers shall be the charges which are applied to the suppliers uplifted to include distribution network losses (for consumers connected to the distribution network) depending on the network voltage level of the consumer's premises connection.
- 8.18 T-NH shall be applied on a geographically uniform basis throughout Cyprus.
- 8.19 The transmission system operator shall follow a two-step approach to setting T-NH for approval by CERA. As a first step, T-NH shall be initially set so as to reflect the long run marginal cost of transmission (energy and capacity). As a second step T-NH shall be adjusted so as to meet transmission revenue requirements (energy and capacity).
- 8.20 The proportion of allowed transmission revenues to be recovered from capacity charges in a year is set out in Appendix 4. The remainder of allowed revenues shall be recovered through energy charges.
- 8.21 The approach to estimating the long run marginal cost of transmission is intended to be fit for purpose when Cyprus has demand growth and network investment needs in the foreseeable future. Prior to this the marginal cost is likely to be low and a detailed study may not be required.
- 8.22 The approach to estimating the long run marginal cost of transmission shall be as follows:
- a. Establish the planning horizon for the purposes of calculating T-NH.
  - b. Develop a base case plan for development of the network to meet expected peak demand for injections to the network over that planning horizon.
  - c. Calculate the marginal cost using a method based on the Average Incremental Cost.
  - d. The long run marginal cost is the discounted additional cost based on the basic plan divided by the discounted value of the annual change in the demand over the planning horizon. It is understood that for the purposes of calculating the T-NH the long run marginal cost cannot be negative.
  - e. When establishing the costs of the network, the remaining value of assets at the end of the planning horizon should be taken into account, e.g. using annuities or residual values.
- 8.23 The long run marginal costs of transmission shall be expressed in € per MW per year, where MW is the coincident peak system demand for the year as measured as injections to the transmission system. Prior to the start of the year a study shall be made as to the probability that each half hour will be the coincident system peak hour of the year. The long run marginal cost of transmission shall be apportioned across individual half hours within a year by multiplying the long run marginal cost of transmission by the probability that the half hour will be the coincident peak half hour of the year. The calculation of the probability must take into

consideration the available data from historical load curves and predicted changes in their profile, but may also rely on informed judgement as appropriate.

- 8.24 In practice, those half hours with a very small probability of being the peak hour shall be ascribed a zero probability of being the peak hour for the purposes of setting tariffs. Hours with a similar probability of being the peak hour can be grouped together and have a single probability ascribed to all hours in the group. The sum across the year of the ascribed probabilities shall be 1.
- 8.25 A uniform scaling factor shall be made to the capacity component of T-NH so as to expect to meet the proportion of allowed transmission revenues to recover from capacity charges, as described in paragraph 8.20. Remaining allowed revenues shall be recovered from a uniform energy charge expressed as €/MWh.
- 8.26 The capacity and energy component of T-NH to be applied to an end user's metered load shall be adjusted for average annual network losses at the voltage level to which the user is connected and average annual network losses at all voltage levels above that level. An adjustment shall also be made to reflect the contribution of the customer class to coincident peak demand, as derived from the class load curve.
- 8.27 In the case of an end user with on-site generation, the energy component of part of T-NH shall be applied to the gross consumption of the user and the capacity component of that part of T-NH shall be applied to the gross demand of the user, where metering allows the gross consumption and gross demand to be identified. The proportion of T-NH to be applied will be based on the results of appropriate studies that consider drivers of transmission system long run marginal costs and the relative scale of the long run marginal cost component and the cost recovery component for recovery of allowed revenues.
- 8.28 Where the gross demand or gross consumption of an end user with on-site photovoltaic generation cannot be identified, the capacity and the energy component of the part of T-NH as above shall be applied to the net demand or net consumption, as applicable, of the user, and the capacity related component adjusted to reflect expected on-site generation at peak times and the energy related component adjusted to reflect expected on-site generation throughout the year. The adjustment may be determined according to the expected on-site generation of a typical similar customer to the customer to which that part of T-NH shall apply.
- 8.29 In the case of an end user customer with interval metering, the capacity component of the part of T-NH as above shall be levied on energy where the conversion from a capacity charge to an energy charge is based on the ratio of MW to energy for the load curve for the customer class. The load curve for the entire customer class shall be used, which is distinct from the load curve for a typical individual customer within a customer class.

## Tariff methodology

### T-NM: Use of Distribution System Tariff at Medium Voltage

- 8.30 T-NM is the use of distribution system tariff at the medium voltage level and shall apply in respect of all loads connected to the Cyprus electricity distribution network. T-NM shall be set so as to recover the allowed total revenues of the distribution network at the medium voltage level, excluding connection revenues and other customer contributions.
- 8.31 T-NM shall be applied to a supplier as a charge related to each of the supplier's end user customers connected to the distribution network. The supplier shall apply the same charge to its end user customers. The charges that the suppliers apply to the end consumers shall be the charges which are applied to the suppliers uplifted to include distribution network losses (for consumers connected to the distribution network) depending upon the voltage level of the consumer's premises connection.
- 8.32 T-NM shall be applied on a geographically uniform basis throughout Cyprus.
- 8.33 The proportion of allowed revenues for the distribution network at the medium voltage level to be recovered through capacity charges in a year is set out in Appendix 4. The remainder of allowed revenues shall be recovered through energy charges.
- 8.34 The capacity charge component of T-NM shall be set by dividing the allowed revenues to be recovered through capacity charges in a year by the sum of the forecast anytime peak load for the year of all customers connected to the medium voltage and low voltage levels of the distribution network.
- 8.35 The anytime peak load of a customer for the purposes of paragraph 8.34 shall be the peak load of the customer as measured or estimated at the customer's site, adjusted for average annual distribution network losses. For customers connected to the low voltage level of the distribution network, the loss adjustment shall relate to average losses on both the low voltage and medium voltage levels. For customers connected to the medium voltage level of the distribution network, the losses adjustment shall relate to average losses on the medium voltage level.
- 8.36 The energy charge component of T-NM shall be set by dividing the allowed revenues to be recovered through energy charges in a year by the sum of the forecast energy load for the year of all customers connected to the medium voltage and low voltage levels of the distribution network.
- 8.37 The energy load of a customer for the purposes of paragraph 8.36 shall be the energy load of the customer as measured at the customer's site, adjusted for average annual distribution network losses. For customers connected to the low voltage level of the distribution network, the loss adjustment shall relate to average losses on both the low voltage and medium voltage levels. For customers connected to the medium voltage level of the distribution network, the losses adjustment shall relate to average losses on the medium voltage level.

- 8.38 In the case of a user with on-site generation, the capacity and the energy component of part of T-NM shall be applied to the gross consumption of the user where metering allows the gross consumption to be identified. The proportion of T-NM to be applied will be based on the results of appropriate studies carried out by the DSO which consider drivers of distribution system long run marginal costs and the relative scale of the long run marginal cost component and the cost recovery component for recovery of allowed revenues.
- 8.39 Where the gross consumption cannot be identified, the capacity and the energy component of the part of T-NM as above shall be applied to the net consumption of the user and the capacity related charge adjusted to reflect the user's expected maximum generation at the time of the user's peak consumption and the energy related charge adjusted to reflect the user's expected generation throughout the year. The adjustment may be determined according to the expected on-site generation of a typical similar customer to the one to which that part of T-NM shall apply.
- 8.40 In the case of an end user customer with interval metering, the capacity component of the part of T-NM as above shall be levied on energy where the conversion from a capacity charge to an energy charge is based on the ratio of MW to energy for a typical customer in the customer class to which the end user belongs.

### T-NL: Use of Distribution System Tariff at Low Voltage

- 8.41 T-NL is the use of distribution system tariff at the low voltage level and shall apply in respect of all loads connected to the low voltage level of the Cyprus electricity distribution network. T-NL shall be set so as to recover the allowed total revenues of the distribution network at the low voltage level, excluding connection revenues and other customer contributions.
- 8.42 T-NL shall be applied to a supplier as a charge related to each of the supplier's end user customers connected to the distribution network at the low voltage level. The supplier shall apply the same charge to its end user customers. The charges that the suppliers apply to the end consumers shall be the charges which are applied to the suppliers uplifted to include distribution network losses (for consumers connected to the distribution network) depending on the network voltage level of the consumer's premises connection.
- 8.43 T-NL shall be applied on a geographically uniform basis throughout Cyprus.
- 8.44 The proportion of allowed revenues for the distribution network at the low voltage level to be recovered through capacity charges in a year is set out in Appendix 4. The remainder of allowed revenues shall be recovered through energy charges.
- 8.45 The capacity charge component of T-NL shall be set by the DSO by dividing the allowed revenues to be recovered through capacity charges in a year by the sum of the forecast anytime peak load for the year of all customers connected to the low voltage level of the distribution network.

### Tariff methodology

- 8.46 The anytime peak load of a customer for the purposes of paragraph 8.45 shall be the peak load of the customer as measured or estimated at the customer's site, adjusted for average annual distribution network losses on the low voltage level.
- 8.47 The energy charge component of T-NL shall be set by dividing the allowed revenues to be recovered through energy charges in a year by the sum of the forecast energy load for the year of all customers connected to the low voltage level of the distribution network.
- 8.48 The energy load of a customer for the purposes of paragraph 8.47 shall be the energy load of the customer as measured or estimated at the customer's site, adjusted for average annual distribution network losses on the low voltage level.
- 8.49 In the case of a user with on-site generation, the capacity and the energy component of part of T-NL shall be applied to the gross consumption of the user where metering allows the gross consumption to be identified. The proportion of T-NL to be applied will be based on the results of appropriate studies carried out by the DSO which consider drivers of distribution system long run marginal costs and the relative scale of the long run marginal cost component and the cost recovery component for recovery of allowed revenues.
- 8.50 Where the gross consumption cannot be identified, the capacity and the energy component of the part of T-NL as above shall be applied to the net consumption of the user and the capacity related charge adjusted to reflect the user's expected maximum generation at the time of the user's peak consumption and the energy related charge adjusted to reflect the user's expected generation throughout the year. The adjustment may be determined according to the expected on-site generation of a typical similar customer to the one to which that part of T-NL shall apply.
- 8.51 In the case of an end user customer with interval metering, the capacity component of the part of T-NL as above shall be levied on energy where the conversion from a capacity charge to an energy charge is based on the ratio of MW to energy for a typical customer in the customer class to which the end user belongs.

#### **T-AS: Tariff for the Provision of Ancillary Services and long-term reserve**

- 8.52 The TSOC is responsible for procuring the ancillary services necessary to maintain the system balance, quality of electricity and to allow system restoration from a wide-spread black out. T-AS shall be set so as to allow the TSOC to recover its allowed costs of long run reserve and the following ancillary services:
- a. black start;
  - b. voltage control;
- 8.53 T-AS shall be applied to suppliers in respect of the suppliers' end consumers. A non-dominant supplier shall be free to decide how best to recover the cost from its end consumers, in accordance with paragraphs 5.2 and 7.10.

- 8.54 With regard to suppliers with a dominant position, T-AS shall include, in addition to the above, the operating reserves and frequency control which are attributable to the dominant supplier.

### *Black start*

- 8.55 Selected generators must have the capability to start in isolation of an energised power system. The TSOC would typically procure black start capability through a contract awarded on the basis of a tender.
- 8.56 For the sake of simplicity and equity, the T-AS tariff component used to recover the allowed costs of the TSOC procuring black start services shall be levied on suppliers in the same way as T-NH, in respect of all end consumers connected to the power system.

### *Voltage control*

- 8.57 Transmission voltage is controlled through adjustments in generator reactive output and transformer taps, and by switching capacitors and inductors on the transmission and distribution systems. Some level of voltage control service is provided by all generators, in accordance with the grid code. The TSOC may procure additional voltage control services through contracts and provides voltage control equipment itself on the transmission system.
- 8.58 The T-AS component, used to recover the allowed costs of providing voltage control services, shall be recovered through a charge levied on suppliers in the same way as T-NH, in respect of all end consumers connected to the power system.
- 8.59 To the extent transmission assets are used to provide voltage control services, capital and operating costs related to those assets shall be recovered through either T-NH or T-AS, not both.

### *Operating reserves*

- 8.60 The TSOC procures three types of operating reserves to manage the system balance: the Frequency Containment Reserve (FCR), the Frequency Restoration Reserve (FRR) and the Replacement Reserve (RR). Recovering the cost of capacity availability and the energy cost shall be done through the wholesale market, as described in the new Electricity Market arrangements in Cyprus Regulatory Decision, REG.164/2015, and as will be formulated in the applicable Electricity Market Rules.

### *Frequency control*

- 8.61 The system must be capable of continuously monitoring and controlling frequency in response to deviations between system supply and demand.

## **Tariff methodology**

- 8.62 The T-AS tariff component used to recover the allowed costs of the TSOC procuring an ancillary frequency control service shall be levied on the dominant supplier as described in the new Electricity Market arrangements in Cyprus Regulatory Decision, REG.164/2015, and as will be formulated in the applicable Electricity Market Rules.

### *Long run reserve*

- 8.63 The TSOC may procure long run reserves to ensure the system has sufficient generation capacity. The cost of the long run reserve shall be calculated based on the periodic power demand from the suppliers.
- 8.64 The T-AS tariff component used to recover the allowed costs of the TSOC procuring long run reserves shall be levied on suppliers in the same way as the power component of T-NH, in respect of all end consumers connected to the power system.

### **T-BM: Tariffs for Business Management Services**

- 8.65 Business management services relate to the costs incurred by a supplier in managing its customers, e.g. managing contracts and billing, providing a telephone helpline and complaints service, providing retail offices etc.
- 8.66 A non-dominant supplier shall be free to decide how best to recover the cost of business management services from its end consumers, in accordance with paragraphs 5.2 and 7.10.
- 8.67 In the case of a dominant supplier, the tariff applied to end-consumers to recover the cost of business management services shall be regulated in the form of an allowance for reasonable business management costs plus an allowed margin on such costs.
- 8.68 The allowed margin shall be that set out in Appendix 4.
- 8.69 The regulated tariff for business management services shall be in the form of a fixed charge per customer per day that may vary according to the type and size of customer and the type of meter, in accordance with paragraph 7.10 and paragraph 5.2.
- 8.70 Prior to the start of each year, the regulated supplier shall propose the set of tariffs for business management services to apply for the year. CERA shall review and decide whether to approve or reject the tariff proposal.

### **T-PRC: Tariffs for the Levies PSO, RES-E, High-Efficiency Co-generation**

- 8.71 The TSOC incurs costs in complying with or compensating others for complying with public service obligations, promoting renewable electricity generation and promoting high-efficiency co-generation.

- 8.72 T-PRC shall be set so as to allow the TSOC to recover its allowed costs in relation to the activities described in paragraph 8.71. The TSOC shall be covered against the financial risks to which it may be exposed to, through corresponding guarantees.
- 8.73 In accordance with the Regulating the Electricity Market Laws of 2003-2012, the component of T-PRC related to the recovery of the costs of promoting renewable electricity generation and promoting high-efficiency co-generation shall be in the form of an energy charge.
- 8.74 The component of T-PRC related to the recovery of the costs of public service obligations shall be recovered through a charge levied on gross consumption.
- 8.75 The energy charge component of T-PRC shall be set by dividing the costs to be recovered through energy charges in a year by the sum of the forecast energy load for the year of all customers connected to the electricity system.
- 8.76 The energy load of a customer for the purposes of paragraph 8.75 shall be the energy load of the customer as measured or estimated at the customer's site, adjusted for average annual network losses at the voltage level to which the user is connected and average annual network losses at all voltage levels above that level.
- 8.77 In the case of a user with on-site generation, T-PRC shall be applied to the gross consumption of the user where metering allows the gross consumption to be identified.
- 8.78 Where the gross consumption cannot be identified, T-PRC shall be applied to the net consumption of the user and the energy related charge adjusted to reflect expected generation throughout the year. The adjustment may be determined according to the expected on-site generation of a typical similar customer to the one to which T-PRC shall apply.
- 8.79 T-PRC shall be levied on the suppliers in respect of each supplier's customers following the provisions of the Legislation and each supplier shall apply the same charge to its end customers.

### **T-TSO: Tariff for TSOC Expenses**

- 8.80 The TSOC incurs costs in managing the Cyprus electricity system. The allowed costs of the TSOC shall be recovered through T-TSO. The allowed cost includes the cost of metering in the transmission network, which will be applied to the suppliers in the form of a fixed charge per customer, and the charge will vary according to the type of meter installed at the location of the supplier's customer or will correspond to meter type for high-voltage connections.
- 8.81 In the course of the operation of the Electricity Market, especially with regard to the Balancing Mechanism, the TSOC (as Market Operator) may incur costs or gain

### **Tariff methodology**



financial benefit. In such cases, the T-TSO shall be readjusted accordingly at the end of the year so that the differences are carried over into the following year.

- 8.82 T-TSO shall be recovered through a charge levied on gross consumption and gross demand in the same way as T-NH.
- 8.83 T-TSO shall be levied on each supplier in respect of the supplier's customers and the supplier shall apply the same charge to its end user customers.

### **T-MET: Tariff for Metering Expenses**

- 8.84 The distribution system operator is responsible for metering of customer off-takes from the distribution networks and of the energy produced in the distribution network; and for processing the measurements to calculate the total energy of electricity market participants in the distribution network. The distribution system owner is responsible for the purchase, installation and maintenance of the meters in the distribution network.
- 8.85 T-MET shall recover the allowed revenues related to the costs of reading the meters of all end consumers and generators connected to the distribution network. For the avoidance of doubt, the allowed revenues relating to the capital costs of the meters in the distribution network shall be covered by the T-NM and T-NL tariffs; the allowed revenues relating to the cost of measurements in the transmission network shall be covered by the T-TSO tariff; and the allowed revenue relating to the capital cost of the meters in the transmission network shall be covered by the T-NH tariff.
- 8.86 T-MET shall be levied in the form of a fixed charge per customer on suppliers, with the charge varying according to the type of meter installed at the supplier's customer's site, or a proxy for the type of meter such as voltage level of connection.
- 8.87 A regulated supplier shall pass through the cost related to T-MET to the end consumer in the same form and level as T-MET is levied on the supplier with respect to that end consumer.
- 8.88 Prior to the start of a year, the DSO shall propose T-MET to apply for the year in question. CERA shall review and approve or reject the proposal.

### **T-RET: End Consumer Bills**

- 8.89 T-RET is the regulated tariff applied to end consumers to recover the costs of supply by a dominant supplier, including costs related to T-BM. A non-dominant supplier is free to set retail tariffs in accordance with paragraphs 5.2, 7.8 and 7.10.
- 8.90 T-RET for a customer shall comprise the sum of the components of all regulated tariffs, as presented in detail in Table 1, applied to the dominant supplier plus the cost of the electricity which it procured via the pool.

- 8.91 An end consumer bill shall be simple, clear and provide sufficient information to allow consumers to make consumption decisions and supplier choices. A bill shall provide at least the following information:
- a. the total price of electricity; and
  - b. the breakdown of the total price into:
    - i. a base price that forms the unregulated or potentially unregulated component of price, including *inter alia* the cost of generation and the supply margin, to allow consumers to compare suppliers' offers;
    - ii. network charges (including TSOC costs);
    - iii. PSO;
    - iv. renewable energy source and high-efficiency cogeneration costs;
    - v. other costs; and
    - vi. taxes.
- 8.92 Pursuant to Directive 2012/27/EU Annex VII where it is stipulated that in order to enable end consumers to control their energy consumption, the billing must be based on actual consumption at least once a year. Billing information must be made available at least quarterly, upon request, or if the consumers have opted to receive electronic billing, otherwise twice a year.
- The following information must be provided to end consumers in a clear and understandable way in their bills, contracts, transactions and receipts, or accompany the aforementioned at billing distribution stations.
- a. current actual prices and the actual energy consumption;
  - b. comparisons of the end consumer's current energy consumption with the consumption for the same period in the previous year, preferably in graphic form;
  - c. where possible, comparisons with the average normalised or typical end consumer in the same user category;
  - d. contact information for end consumers' organisations, energy agencies or similar bodies, including website addresses, from which information may be obtained on available energy efficiency improvement measures, comparative end-user profiles and/or objective technical specifications for energy-using equipment;
  - e. advice on energy efficiency attached to bills and other types of informative material to end consumers.
- 8.93 End consumers shall be offered the option of electronic billing information and bills and, if requested by customers, they shall receive a clear and understandable explanation of how their bill was arrived at, especially in cases where the bills are not based on actual consumption.

## Tariff methodology

- 8.94 End consumers shall receive all bills and information about energy consumption free of charge, and end consumers' access to details about their consumption shall also be free (Directive 2012/27/EU on energy efficiency, Article 11 paragraph 1).



# Appendix 1: Principles of Regulatory Asset Value Base (RAVB)

## 1 Introduction

### 1.1 Regulated Asset Value Base (RAVB)

RAVB is defined as the net book value of the regulated assets (fixed assets) of an organisation and is used for regulating the tariffs. The assets which are included in RAVB have to be used solely for the provision of regulated services. As a rule only efficient investments that are in the long term interest of the consumer, and are approved by CERA should be included in the regulated Organisation's RAVB.

RAVB needs to be calculated on an annual basis for each of the regulated activities of Transmission, Distribution and Generation if the latter is a dominant activity in the generation market. RAVB is used for the determination of the Depreciation of Fixed assets, as well as the Return of Capital, i.e. the Return on RAVB.

## 2 Calculation and Parameters of RAVB

### 2.1 RAVB Equation

RAVB is calculated as follows, at the end of each year:

$$\mathbf{RAVB}_{\tau} = \mathbf{RAVB}_{\tau-1} + \mathbf{INV}_{\tau} - \mathbf{S}_{\tau} - \mathbf{D}_{\tau} - \mathbf{\Delta CC}_{\tau} + \mathbf{\Delta WC}_{\tau}$$

Where:

$\tau$  = reporting year

$\mathbf{RAVB}_{\tau}$  = Total regulated RAVB of the reporting year, i.e. final RAVB.

$\mathbf{RAVB}_{\tau-1}$  = Approved RAVB in the previous year, i.e. opening RAVB.

$\mathbf{INV}_{\tau}$  = Investments (capital expenditure) of the reporting year.

$\mathbf{S}_{\tau}$  = Sales/ Disposals in the reporting year.

$\mathbf{D}_{\tau}$  = Depreciation in the reporting year.

$\mathbf{\Delta CC}_{\tau}$  = Change in the Customers' Contributions in the reporting year.

$\mathbf{\Delta WC}_{\tau}$  = Change in the Working Capital in the reporting year.

Each electricity company should maintain a RAVB for each of the regulated activities of Transmission, Distribution and Generation if the latter is a dominant activity in the generation market, in accordance with the principles as set forth below. The allocation of assets to any regulated activity carried out by the electricity company, is carried out in accordance with the

Regulations on the Accounting Separation of EAC activities. The allocation criteria used for the allocation of assets between the various activities is updated on an annual basis and is subject to audit by independent auditors, in accordance with the Regulations on the Regulatory Accounting Guidelines for the preparation of Separated Regulated Accounts (SRAs).

### 2.1.1 Average RAVB

The best practice for calculating the Allowable Revenue (AR), is using the average RAVB, i.e. the average of the opening and closing RAVB, as follows:

$$\text{AR RAVB}_\tau = (\text{RAVB}_\tau + \text{RAVB}_{\tau-1}) / 2$$

Where:

**AR RAVB<sub>τ</sub>** = RAVB used for calculating the AR.

## 2.2 Assets valuation Method

The asset valuation method (e.g. historic cost, replacement cost, etc.) needs to comply with the at times in force Electricity Tariffs Methodology as approved by CERA, and any other relevant Decisions.

## 2.3 Useful Life of Assets & Depreciation Method

The Useful Life of the assets included in RAVB should be approved by CERA. The Depreciation Method for the assets included in RAVB is the straight line method.

## 2.4 Working Capital

Working Capital should include all current assets and liabilities of the activity, less any interest bearing short term deposits and liabilities. The inclusion, non-inclusion or partial inclusion of WC in RAVB, needs to comply with the at times in force Electricity Tariffs Methodology as approved by CERA, and any other relevant Decisions.

## 2.5 Work in Progress – WIP

WIP must not be included in RAVB. The inclusion of WIP in RAVB would circumvent the Used and Useful principle, which is a basic regulatory principle (this principle states that in order for the customers to pay for any asset, this needs to be fully in use and to provide a benefit to these customers). RAVB cannot bear investments in projects which have not yet been implemented and thus have not started their operation (this way, the current consumers will not repay, through tariffs, investments for which they will bear the benefits in the future, or they may not even bear the benefits, or new consumers will bear the benefits).

## Appendix 1: Principles of Regulated Asset Value Base (RAVB) for the Regulated Activities

Each electricity company should maintain and perform a regular review of the WIP register and assess which assets are to be capitalised and transferred to the Fixed Asset Register and which ones to remain in WIP until completion.

CERA may perform regular reviews on the WIP register so as to assess that WIP is in line with the at times approved investment plan of the regulatory control period, as referred to in Appendix 4.

## **2.6 Capital Contributions**

RAVB will not include the value of fixed assets or the part of the value of the fixed assets which was financed through consumers or producers contributions.

The depreciation on Capital Contributions will not be included in the computation of the Network Use charges.

The depreciation on Capital Contributions will not be included in the computation of the return on capital for each regulated activity.

Capital Contributions need to be directly connected with specific projects (and fixed assets), so that they will not need to be allocated to the Transmission and Distribution Activities at the end of the year. If in any case a direct allocation of a capital contribution to specific projects cannot be made, the electricity company needs to provide CERA with the necessary explanation for the methodology used for the determination of the allocation factors.

## **2.7 Non-Regulated Activities**

Concerning EAC, RAVB must not include any assets that relate to non-regulated activities, such as:

- Inspections
- Desalination Plant
- Street Lighting maintenance
- Meter Control and Repair Centre
- Design, Supply and Installation of Photovoltaic Systems for others
- Telecommunications services
- Other Contracting work
- Supply
- Any other non-regulated activity

The above activities do not constitute a necessary duty and an integral part of the three basic regulated activities of EAC (Generation, Transmission and Distribution), and therefore must not be included in RAVB.

## **Appendix 1: Principles of Regulated Asset Value Base (RAVB) for the Regulated Activities**

## 2.8 Investments (Capital Expenditure)

CERA will conduct an **ex-ante** assessment of the accordance and efficiency of a company's proposed investment program for the forthcoming regulatory 5-year period considering future demand growth, asset configuration and any other relevant information. The electricity companies must submit to CERA their CAPEX projections (see Chapter 3 below).

The ex-ante assessment will be performed based on the 5-year business/ investment plan which has to be submitted to CERA for approval, and which has to be used for the determination of Tariffs, according to the at times in force Electricity Tariffs Methodology as approved by CERA, and any other relevant Decisions.

CERA may undertake **ex-post** assessments of the capital expenditure undertaken. The aim will be to identify differences between the capital expenditures allowed in the *ex-ante* review and the actual investments undertaken by the electricity company. In such cases, the reasonableness of the exceeded amount will be investigated by CERA and possibly the extra amount excluded from the RAVB. For the purposes of the ex-post assessment, the documents referred to in paragraph 3.3 below shall be submitted.

## 3 Documents submission & Audit process

### Submission of documents to CERA

The electricity companies need to submit to CERA on an annual basis, together with the Separated Regulatory Accounts (SRAs), the following:

#### 1. Work in Progress – WIP

- Work in Progress Register, for each regulated activity separately, and comparison of this with the at times approved 5-year business/ investment plan.

#### 2. RAVB:

- The RAVB for each regulated activity separately, and in total.
- Additions, disposals/ transfers and the initial approved RAVB for each activity should be clearly shown.
- The Net Book Value of assets of the non-regulated activities needs to be clearly shown.
- Also, a full reconciliation with the SRAs of the year needs to be presented.

#### 3. Investments (Capital expenditure):

- Statement of Investments (Capital expenditure) that have been realised during the year and a comparison with the plan for the regulatory control period (Appendix 4) that was approved by CERA (see Chapter 2.8 above).

### Appendix 1: Principles of Regulated Asset Value Base (RAVB) for the Regulated Activities



### **3.2 CERA Audit Process**

CERA (or its authorized consultants) may carry out checks to verify the correct implementation by the electricity company, of the above.

For this purpose, CERA, in addition to the documents mentioned above (see Section 3.1) has the ability to access the accounts of electricity companies, for the provision of additional explanations or clarifications on the above.



## APPENDIX A

Regulated Asset Value Base (RAVB)							
For the year ending							
		Separated Regulatory Accounts	Attributed to				
			Regulated Activities			Non-Regulated Activities	
		€000s	€000s			€000s	
			Generation	Transmission	Distribution		
<b>Opening RAVB</b>							
Additions							
Disposals							
<i>Negative number</i>							
Impairment							
<i>Negative number</i>							
Capital Contributions							
<i>Negative number</i>							
Other adjustments							
Depreciation							
<i>Negative number</i>							
<b>Closing RAVB</b>							



## Appendix 2: Methodology of Calculating the Weighted Average Cost of Capital (WACC) for the Generation, Transmission and Distribution Activities

### 1. Introduction

The Weighted Average Cost of Capital (WACC), is the minimum return that a business or organisation is expected to pay on average, to its shareholders/ owners to finance its assets.

The WACC (pre-tax) of a business is the weighted average cost of the various funding sources, with weighting factors of the percentage contributions of each source in the composition of capital (i.e. the capital structure) of the business at nominal values and is determined as follows:

$$\text{WACC (pre - tax)} = R_e \times \frac{E}{(D + E)} \times \frac{1}{(1 - T_c)} + R_d \times \frac{D}{(D + E)}$$

Where:

$R_e$  = Cost of equity

$R_d$  = Cost of debt

$E$  = Equity

$D$  = Debt

$T_c$  = Corporate tax rate.

The current Methodology refers to the Methodology for calculating the WACC for each regulated activity in the electricity market specifically for each regulated activity of a Vertically Integrated Entity.

'Vertically Integrated Entity "means an electricity undertaking or group of undertakings of electricity, where the same person or persons are entitled, directly or indirectly, to exercise control, and where the undertaking or group of undertakings perform at least one of the transmission or distribution activities and at least one of the generation or supply of electricity activities (Article 2 of the Regulation of the Electricity Market Law, 2003-2012).

The assumptions and data used in the calculation of the WACC Methodology for each regulated activity will be controlled by CERA.

## 2. WACC calculation methodology

### 2.1 Re – Cost of Equity

The calculation of the cost of equity arises from the Capital Asset Pricing Model – CAPM valuation model. The CAPM can be calculated as follows:

$$R_e = r_f + \beta_e \times ERP$$

Where:

**R<sub>e</sub>**: Cost of equity

**r<sub>f</sub>**: Risk Free Rate

**r<sub>m</sub>**: Market Risk

**ERP = (r<sub>m</sub> – r<sub>f</sub>)**: Equity Risk Premium

**β<sub>e</sub>**: Systematic risk factor («relevered beta» – «β») – calculation of the systematic risk of a security (the beta of the investment in question)

### 2.2 Risk Free Rate (rf)

The risk free rate is the expected return that an investment in an asset with zero risk can earn. In practice it is impossible to find an investment that is free from all risks. However, the investment grade government bonds which are freely marketed (by powerful economic states) can be considered as having a default risk of a specific contractual obligation near to zero since these governments are unlikely to fail.

The choice of government that issues the bonds need be made, so that the government, and thus the bond, will be considered low risk in the long term, and any changes in its performance over time will be small. The bonds that will be selected must be in the same currency as that in which the organisation operates, i.e. the euro in this case.

The maturity period of the bond should reflect as much as possible the period of depreciation of the fixed assets of the Organisation. This period for EU organisations active in the electricity market is 20-25 years. However, long-term bonds are likely to be influenced by exogenous factors, and therefore, their nominal performance may differ from their actual performance. Most countries in the EU, use ten sovereign bonds for the purpose of calculating the risk-free rate.

Based on the methodology as described above, and taking into account the difficult economic conditions that Cyprus faces, the Risk Free Rate should not be calculated using the Cypriot sovereign bonds, since that would result in a disproportionately high WACC.

Therefore, and until the difficult economic conditions that Cyprus faces are terminated, sovereign bonds of other EU countries which are considered low risk, for example of Germany, should be used. Taking into account the future inflation and any differences between the interest they bear in relation to their return in the market, the return of these bonds until their maturity are considered as the appropriate substitute for the Risk Free Rate.

The Risk Free Rate values do not differ between the Activities of a Vertically Integrated Entity.

## Appendix 2: Methodology of Calculating the Weighted Average Cost of Capital (WACC) for the Generation, Transmission and Distribution Activities

## 2.3 Equity Risk Premium

The Equity Risk Premium is the additional return that an investor requires, so as to accept the systematic risk that arises from investments in assets with a risk different than zero. In essence, it is the excess return required due to the increased risk relative to a risk-free investment and therefore it is calculated as the difference between the Market Risk (yield) and the Risk Free Rate:

$$\text{ERP} = r_m - r_f$$

The Market Risk ( $r_m$ ) is the additional return of a market portfolio, compared to the risk free rate. For the purposes of calculating the WACC, the Market Risk is defined as the historic average of risks for a chosen market sample.

## 2.4 Systematic Risk Factor («β» - beta)

«β» is defined as the measure of systematic risk (non-diversifiable risk) of a bond/ share in relation to the market at its whole, it relates to the extend in which the return of a share is affected by market volatility.

The determination of a «β» of an organisation, requires an analysis of the return of the organisation compared with the return of an appropriate stock market index. Therefore to perform the above analysis, it is necessary that the organisation is registered with a stock market.

For the determination of «β» where the organisation is not registered in a stock market, common practices necessitate comparative studies based on a sample of organisations operating in similar sectors. The «β» is defined as the average of the «β» values of different organisations operating in the same field, for each activity of a vertically integrated entity, separately.

The information for these organisations is publicly available, and therefore can be easily extracted using information from financial databases for each of the activities of Generation, Transmission and Distribution.

The «β» drawn from such databases, correspond to «β» Equity of the organisations and take into account the percentage of leverage of each organisation in the sample. Due to the different rates of gearing between the organisations in the sample and the organisation for which "b«β» needs to be determined, the average «β» of the sample is not a reliable indicator. It is therefore essential that the «β» Equity of the sample, is converted to «β» Assets, the average of which would adequately reflect the «β» of the Assets of the Organisation. Then, the «β» of Asset which has been determined, is converted (re-levering) to «β» Equity using the gearing of each activity and the applicable tax rate.

## 2.5 $R_d$ – Cost of Debt

The cost of debt is the average interest rate that an organisation pays on the current debt, which is financing costs of loans, bonds or other forms of debt, as a percentage. Along with the cost of capital, it constitutes the capital structure of the organisation.

The cost of debt should be calculated for each activity of a vertically integrated entity separately, taking into account the debt of each activity. Total Borrowing Costs are calculated and presented in the annual audited financial statements of the Organisation.

Given the need for calculating WACC for all activities the ideal approach should be based on a detailed separation of debt (loans) and related interest of the organisation in the activities of Generation, Transmission and Distribution, and the calculation of interest rate cost should be carried out separately for each activity

## 2.6 Effective Tax Rate ( $T_c$ )

The Effective Tax Rate for an organisation, is the weighted tax rate based on which the pre-tax profits are taxed. It is calculated by dividing the total tax expense of the organisation to the pre-tax profits. It is noted that all tax obligations of the organisation are taken into account, not only the current corporate tax, and therefore Effective Tax Rate may be higher than the corporate tax rate. However, and for simplicity purposes, it is common practice for the corporate tax rate to be used as the Effective Tax Rate.

## 2.7 Capital Structure of the Organisation

Finally, the capital structure of an organisation, i.e. the distinction between equity and debt, is by definition the calculation basis of WACC. The rate that characterizes the capital structure is the debt ratio (Gearing Ratio) calculated as total Debt divided by total Equity as specified within the balance sheet. However, the equation for calculating WACC uses the percentages of Debt and Equity divided by Total Capital ( $D / (D + E)$ ,  $E / (D + E)$ ).

By extension, every Vertically Integrated Entity is required to separate the Equity and Debt per activity for which WACC is calculated.



## Appendix 3: Operating Component of Allowed Revenues

- 3.1 Operating expenditure (opex) is the expenditure that the regulated business incurs on an ongoing, day-to-day basis to run its business. Opex includes items such as maintenance, safety, administration, ancillary services, security, consultancy, legal, insurance, call centre, control centre, human resources (HR), training, and information technology (IT) costs. Opex shall include only such items which will be expensed immediately and which will not be capitalised according to the accounting rules.
- 3.2 CERA shall set separate ex-ante opex allowances for each business undertaking the following activities: transmission (asset ownership), transmission (system operation), distribution (ownership and operation) and, where the business is dominant, generation and supply. For each of these businesses, opex allowances shall be divided into two categories:
- opex over which the undertaking is deemed to have substantial control (“controllable opex”); and
  - opex over which the undertaking is deemed to have no substantial control (“non-controllable opex”); and
- 3.3 In addition to opex for which allowances are set ex-ante by CERA, regulated businesses may incur costs for:
- activities which are regulated, but the costs for which are recovered directly from customers; and/or
  - activities which are unregulated.
- 3.4 Opex for such activities shall be excluded altogether from allowed revenues (“excluded opex”).

### Controllable opex

- 3.5 In general terms, the majority of opex items, such as maintenance and IT costs, shall be treated as controllable. CERA’s proposed categorisation of controllable opex items is presented in Table 1 below. This list may not include all possible controllable opex items, and shall be adapted by CERA in conjunction with each regulated business in order to arrive at a final list for cost reporting purposes. The regulated businesses shall periodically report their costs to CERA, on the basis of this final list.
- 3.6 Working in conjunction with the regulated businesses, CERA shall also create a set of regulatory reporting guidelines for how these costs shall be reported by the regulated businesses. These regulatory reporting guidelines shall:
- include an excel spreadsheet template in which each of the regulated businesses shall report their costs;

- provide, if necessary, a definition for each cost item to be reported, specifying which cost components may need to be included or excluded; and
- specify the periodicity of reporting.

**Table 1. Controllable opex categories**

Transmission (asset owner)	Transmission (system operator)	Distribution (asset owner)	Distribution (system operator)	Generation	Supply
Payroll <sup>2</sup>	Payroll	Payroll	Payroll	Payroll	Payroll
Contractors <sup>3</sup>	Contractors	Planned maintenance	Contractors	Contractors	Contractors
Planned maintenance	IT	Contractors	IT	Operations and maintenance	Bad debt provision
Fault repairs	Insurance	Fault repairs	Insurance	IT	Selling and advertising
Tree cutting	Telecoms	Tree cutting	Telecoms	Insurance	IT
IT	Legal	IT	Legal	Telecoms	Insurance
Insurance	Premises	Insurance	Premises	Legal	Telecoms
Telecoms	Professional Services	Telecoms	Professional Services	Companywide costs	Legal
Legal	Companywide costs	Legal	Asset management	Other general business overheads	Premises
Premises	Other general business overheads	Premises	Companywide costs		Companywide costs
Professional Services		Professional Services	Other general business overheads		Other general business overheads
Asset management		Asset management			
Companywide costs <sup>4</sup>		Companywide costs			
Other general business overheads <sup>5</sup>		Other general business overheads			

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Note: 'Companywide costs and other general business overheads' shall be apportioned between the different regulated businesses. The regulated businesses shall propose a methodology to apportion such costs. CERA shall review and approve the methodology proposed by the regulated businesses. CERA shall describe the approved methodology to apportion these expenses in its regulatory reporting guidelines.

Note2: The cost items in this table are not necessarily mutually exclusive. For example, there may be some payroll costs associated with fault repairs (in relation to the salaries of engineers, for instance). CERA's rationale for aggregating costs in different ways is to understand how the regulated businesses' costs are driven and affected by management choices. Based on its understanding of the regulated businesses' costs, CERA shall decide how appropriate allowances can be set.ote2: The cost items in this table are not necessarily mutually exclusive. For example, there may be some payroll costs associated with fault repairs (in relation to the salaries of engineers, for instance). CERA's rationale for aggregating costs in different ways is to understand how the regulated businesses' costs are driven and affected by management choices. Based on its understanding of the regulated businesses' costs, CERA shall decide how appropriate allowances can be set.

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2 Payroll shall include all staff costs

3 'Contractors' shall include any costs associated with work that the regulated businesses may have outsourced to subcontractors.

4 'Companywide costs' shall include back-office, administration, customer related costs (customer billing, call centre, account management), management, etc.

5 'Other general business overheads' shall include stationary, printing, postage, etc.

- 3.9 Prior to the start of each regulatory control period, each regulated business shall submit a controllable opex allowance request for the forthcoming regulatory control period. The regulated businesses shall provide a clear justification for their requested allowances (clearly outlining the rationale for any potential requested increases relative to outturn costs in the previous regulatory control period). CERA shall review the evidence provided by the regulated companies.
- 3.10 EAC's controllable opex allowance for the base-year for each regulatory control period shall be based on an assessment of each business' own:
- controllable opex request for the next regulatory control period and
  - outturn controllable opex over the previous regulatory control period.
- 3.11 CERA may potentially determine the efficient base-year controllable opex allowance to be lower than outturn controllable opex in the previous regulatory period. These potential reductions to base-year opex shall be referred to as a P0 cut. This may be to account for historic inefficiency or to exclude the costs associated with one-off events unique to the previous regulatory control period, for example. Furthermore, in special circumstances, after giving detailed reasoning, increases to some parts of the controllable opex may also be justified.
- 3.12 Once it has determined its efficient base-year allowance for controllable opex, CERA shall roll this forward by  $\%CPI - X$ , where:
- The Consumer Price Index (CPI) is a proxy for inflation; and
  - The efficiency factor (or X-factor) is intended to account for savings that the business is reasonably expected to be able to achieve in the *future* owing to productivity increases over time.
- 3.13 Prior to the start of each regulatory control period, CERA shall set the efficiency factor (or X-factor) for each regulated business' controllable opex allowances that shall apply for the next regulatory control period.
- 3.14 This efficiency factor may be revised in future regulatory periods on the basis of, including, for example:
- an assessment of dynamic efficiency factors set by other regulators in Europe; and/or
  - an assessment of the regulated business' own scope for dynamic efficiency savings over time.
- 3.15 CERA shall reward the regulated business for any outperformance relative to its controllable opex allowances. The regulated business shall retain 100% of any outperformance (or bear 100% of the cost of any underperformance) relative to CERA's ex-ante target for controllable opex, for the remaining duration of the regulatory control period. At the start of the next regulatory control period, CERA

shall reset each regulated business' controllable opex allowances, having regard to inter alia opex cost performance in the previous regulatory control period.

### Non-controllable opex

- 3.16 Non-controllable opex relates to items such as licensee fees and taxes, which the regulated business does not have control over. CERA's proposed categorisation of non-controllable opex items is presented in **Table 2** below. This may not include all possible non-controllable opex items, and list shall be adapted by CERA in conjunction with each regulated business to arrive at a final list for cost reporting purposes. The regulated businesses shall periodically report their costs to CERA, on the basis of this final list. CERA shall create regulatory reporting guidelines for non-controllable opex, in accordance with paragraph 3.6 above.

Table 2. Non-controllable opex categories

Transmission (asset owner)	Transmission (system operator)	Distribution owner and operator	Generation	Supply
Regulatory levies <sup>6</sup>	Regulatory levies	Regulatory levies	Regulatory levies	Regulatory levies
Local authority fees <sup>7</sup>	Inter-TSO Compensation	Local authority fees	Fuel costs (and fuel quantity by fuel type) <sup>8</sup>	Network charges <sup>9</sup>
Wayleaves <sup>10</sup>	Ancillary Services	Wayleaves	Capacity margin <sup>11</sup>	Energy charges <sup>12</sup>
Pension costs <sup>13</sup>	Pension costs	Pension costs	Environmental obligations	PSOs
Taxes	Taxes	Taxes	Ancillary services	RES-E
			Pension costs	Ancillary service costs
			Taxes	Taxes

<sup>6</sup> Regulatory levies shall include any annual payments made by the regulated firm to CERA.

<sup>7</sup> Local authority fees shall include any annual business property rates paid by the regulated business to the local authority

<sup>8</sup> CERA shall monitor the price and quantity of each fuel used to understand whether the regulated firm's fuel mix is efficient. Fuel costs shall be treated as uncontrollable, to the extent that the regulated firm can demonstrate that it has used the most efficient fuel mix. If CERA considers the regulated firm's fuel mix to be inefficient, part of its fuel costs may be disallowed.

<sup>9</sup> To the extent that such charges are required to be paid by the supply business to the network owners.

<sup>10</sup> Wayleaves shall include any annual payments made by the regulated firm to land owners and/or occupiers to cover the financial impact of having the regulated firm's own equipment or apparatus located on their private land.

<sup>11</sup> If CERA requires a change in the capacity margin to be maintained by a dominant generator, then it may treat the efficient required increase in the associated cost as uncontrollable.

<sup>12</sup> To the extent that such charges are required to be paid by the supply business to the generator.

<sup>13</sup> Some elements may be controllable (and included in payroll), other elements such as legacy costs may be uncontrollable.

- 3.17 Prior to the start of each regulatory control period, each regulated business shall submit a non-controllable opex allowance request for the forthcoming regulatory control period. The regulated businesses shall provide a clear justification for their requested allowances (clearly outlining the rationale for any potential requested increases relative to outturn costs in the previous regulatory control period). CERA shall review the evidence provided by the regulated companies.
- 3.18 CERA’s non-controllable opex allowance for each regulatory control period shall be based on an assessment of each business’ own:
- non-controllable opex request for the next regulatory control period and
  - outturn non-controllable opex over the previous regulatory control period.
- 3.19 CERA shall not place any outperformance incentive or efficiency factor on non-controllable opex, as CERA considers that the regulated firm has no management control over these costs. Non-controllable opex shall therefore be passed through to customers. In other words, if the regulated firm’s outturn non-controllable opex is higher (or lower) than CERA allows for these costs, this may be passed through to customers by adjusting tariffs on an annual basis.

### Excluded opex

- 3.20 In addition to opex for which allowances are set ex-ante by CERA, regulated businesses may incur costs for:
- activities which are regulated, but the costs for which are recovered directly from customers (including customer connections, for example); and/or
  - activities which are unregulated (including MRTC, Inspections, etc).
- 3.21 Opex for such activities shall be excluded altogether from allowed revenues (“excluded opex”). CERA shall review the scope of the regulated firms’ excluded cost items in future regulatory periods to ensure that any new activities which fall under this category are excluded from allowed revenues in the future.
- 3.22 While all excluded opex shall be excluded from allowed revenues, the regulated businesses shall, nonetheless, be required to report these costs to CERA. CERA’s regulatory reporting guidelines shall include a description of these costs and the set out periodicity of reporting.

CERA notes that some ‘companywide costs’ and ‘general business overheads’ as outlined in **Table 1 Controllable opex categories** above, may also need to be apportioned between the regulated businesses’ regulated and unregulated activities. The regulated businesses shall propose a methodology to apportion such costs. CERA shall review and approve the methodology proposed by the regulated businesses.

## Appendix 3: Operating Component of Allowed Revenues



## Appendix 4: Tariff Parameters

CERA shall review and set the parameters in the table below from time to time.

**Table 3.** Tariff parameters

Parameter description	Reference	Value
<b>Duration of the regulatory control period</b>	Paragraph 6.2	5 years
<b>Proportion of allowed transmission revenues to recover through capacity charges</b>	Paragraph 8.20	0% <sup>1</sup>
<b>Proportion of allowed distribution (MV) revenues to recover through capacity charges</b>	Paragraph 8.33	0%
<b>Proportion of allowed distribution (LV) revenues to recover through capacity charges</b>	Paragraph 8.44	0%
<b>Allowed margin for business management services</b>	Paragraph 8.68	20%

<sup>1</sup> To allow consumers time to adapt, a transitional period is adopted for changes to transmission and distribution use of system charges. The transition is to continue to recover 100% of network costs through energy charges for the first five tariff years following entry into force of this methodology, and to recover 50% of network costs through energy charges and 50% through capacity charges for the next following five tariff years.