ZYRA E RREGULLATORIT PËR ENERGJI
ENERGY REGULATORY OFFICE
REGULATORNI URED ZA ENERGIJU

# Review of Electricity Tariff Rules – Explanatory Paper

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## Glossary

| | |
|---|---|
| Relevant Year | The periods within a Regulatory Period during which MAR is adjusted according to pre-determined formulae. Initially, each Adjustment Period will be one year. |
| CPI | Consumer Price Index |
| DSO | Distribution System Operator |
| DSO Pricing Rule | Rule on DSO Pricing |
| Eligible Customers | Customers able to select their supplier and who may be supplied by the PES or another supplier. Comprised of all non-household customers to 31 December 2014 and all customers thereafter (as defined in the Law on Electricity) |
| ERO | Energy Regulatory Office |
| Generation Pricing Rule | Rule on Regulated Generation Pricing |
| LSA | Lignite Supply Agreement |
| MAR | Maximum Allowed Revenue |
| Non-Eligible Customers | Customers not able to choose their supplier and who are supplied by the PES. Comprised of all household customers to 31 December 2014 (as defined in the Law on Electricity) |
| Periodic Review | The review and reset of MAR and other parameters ahead of the start of a Regulatory Period |
| PES | Public Electricity Supplier (holder of the Public Supply licence) |
| PES Pricing Rule | Rule on PES Pricing |
| PPA | Power Purchase Agreement |
| Pricing Rules | Collective term for the Generation Pricing Rule, TSO Pricing Rule, DSO Pricing Rule and PES Pricing Rule |
| RAB | Regulatory Asset Base |
| Regulated Customers | Non-eligible customers and those eligible customers where competition in supply is not effective and who, therefore, are supplied by the PES at retail tariffs regulated by ERO in accordance with the Law on the Energy Regulator |
| Regulated Generator | A generator as defined in Article 7 of the Law on Electricity, which is obliged to supply the PES at a regulated price |
| Regular Adjustment | The recalculation of MAR in accordance with pre-determined formula, ahead of each Adjustment Period |
| Regulatory Period | The period between Periodic Reviews during which MAR is updated according to a predetermined formula |
| TSO | Transmission System Operator |
| TSO Pricing Rule | Rule on TSO Pricing |
| Unregulated Customers | Those customers who are not regulated |
| WACC | Weighted Average Cost of Capital |

| | |
|---|---|
| WPC | Wholesale Power Costs |

# 1 Introduction

The Energy Regulatory Office (ERO) is currently in the process of revising the secondary legislation governing the regulation of electricity tariffs and charges (collectively referred to in this paper as "Tariff Rules") to conform to the amended Laws on Energy, Electricity and the Energy Regulator as promulgated in November 2010. The Tariff Rules will replace the existing Pricing Rule and Tariff Methodology issued by ERO.

This paper provides a summary explanation of these Tariff Rules to accompany the publication of the rules for public consultation.

# 2 The set of Tariff Rules

Under the Law on Electricity and Law on the Energy Regulator, ERO is responsible for:

- Regulating tariffs included in Power Purchase Agreements (PPAs) between "Regulated Generators" and the Public Electricity Supplier (PES) where wholesale supply competition is not effective. Regulated generators are those generators defined in Article 7 of the Law on Electricity[1].
- Approving tariff methodologies and tariffs and charges proposed by the Transmission System Operator[2] (TSO) and Distribution System Operator (DSO).
- Determining regulated tariffs for electricity supply to all non-eligible customers and those eligible customers of the PES where retail supply competition is not effective (jointly referred to as regulated customers)[3].

ERO, therefore, intends to issue the following Tariff Rules:

- Rule on Regulated Generation Pricing ("Generation Pricing Rule")

  This Rule will determine how the regulated generation price for sales by Regulated Generators to the PES is established and, the process for determining these prices.

[1] Generators with an installed capacity in excess of 5MW and in operation at the date of coming into force of the Law, selling to the PES. These are Kosovo A, Kosovo B, Ujmani HPP and Lumbardhi HPP.

[2] For the purposes of this paper, the TSO includes the functions of owning and operating the transmission system and of operating the wholesale electricity market.

[3] Separate criteria have been issued by ERO for the purposes of determining whether retail supply competition is effective.

- Rule on Transmission System Operator Pricing ("TSO Pricing Rule")

This Rule establishes: the allowed revenues to be recovered from transmission charges and the principles to be included in the transmission tariffs methodology to be proposed by the TSO.

- Rule on Distribution System Operator Pricing ("DSO Pricing Rule")

This Rule establishes: the allowed revenues to be recovered from transmission charges and the principles to be included in the transmission tariffs methodology to be proposed by the DSO.

- Rule on Public Electricity Supplier Pricing ("PES Pricing Rule")

This Rule establishes: the allowed direct costs of the PES to be recovered from regulated retail tariffs; the pass-through of other costs (wholesale power purchases, TSO and DSO charges) to regulated retail tariffs; the principles for the structure of regulated retail tariffs; and, the process for determining the allowed costs of the PES and regulated retail tariffs.

# 3 TSO Pricing Rule

## 3.1 Form of price control

The price control will take the form of a revenue-cap set for five-year regulatory periods. The starting value for allowed costs will be determined ahead of each regulatory period at a periodic review.

A simplified example of the operation of the rule is included as an annex to this paper.

## 3.2 Determining the initial allowed revenues

### *3.2.1 Approach*

The maximum allowed revenue (MAR) of the TSO for the first year of the regulatory period is determined as the sum of operating expenditures, depreciation of TSO-owned assets included in its Regulated Asset Base (RAB), an allowed return on RAB and an allowance for the costs of purchasing losses:

- An efficient level of operating expenditures will be determined by ERO at the periodic review.
- The RAB will be determined as described below.
- Depreciation of the RAB will be on a straight-line basis using the economic lives[4] of assets.

[4] The economic life is defined as the technical life of the asset, except where the asset is expected to remain in service and earning revenues for a period shorter than its technical life (eg, because the asset is constructed for

- The allowed return will be determined as the approved Weighted Average Cost of Capital (WACC) multiplied by the value of non-grant funded assets included in the RAB. No return will be earned on grant-funded assets.
- The WACC will be calculated as the cost of equity of an equivalent commercial firm (as estimated by ERO) and the actual cost of debt financing[5] weighted using a gearing (debt to equity ratio) determined by ERO.
- The loss allowance will be determined using a target level of losses determined by ERO, taking into account actual loss rates for the most recent 12-month period, any reduction in losses expected during the coming price control period as a result of the TSO's investment programme and the level of transmission losses relative to those of comparable entities.
- The TSO will receive a share (initially expected to be set at 50%) of the value of any reduction in the actual costs of losses below the target level, with the remainder being returned to customers through reductions in allowed revenues. Similarly, any increase in the costs of losses above the target level will be split equally between customers and the TSO.

### *3.2.2 Determining the Regulated Asset Base (RAB)*

The value of the opening RAB used to calculated the starting value of MAR for each regulatory period is determined as the opening RAB at the start of the previous regulatory period, plus approved investments undertaken during the previous regulatory period and less depreciation and disposals (asset sales) over the previous price control period, all indexed to the change in a relevant Consumer Price Index (CPI) over the period.

The indexation to inflation is intended to maintain the value of the TSO's assets constant in real terms. It is a proxy for the replacement cost of these assets—as a full revaluation of assets based on their replacement costs at the start of each regulatory period would be extremely costly, time-consuming and would create significant regulatory risk for the TSO (given the significant amount of discretion involved in replacement cost valuations). As the RAB's value is maintained constant in real terms, the WACC used to calculate the allowed return will also be determined in real terms.

As part of the periodic review, the TSO will submit a proposed list of investment projects to ERO for approval. The list of projects will be based on the Transmission Development Plan approved by ERO, will be ranked in order of priority and will show the estimated costs and benefits. The approved projects will be implemented during the course of the regulatory period.

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a specific customer who will only make use of it for 10 years). The technical lives of assets are significantly longer than the lives used in the financial accounts of licensees at present.

[5] The actual cost of debt is used as it is expected that the TSO will have access to significant amounts of concessionary debt ('soft' loans).

When adding approved investment projects to the opening RAB for the next regulatory period, ERO will use the approved investment cost rather than the actual cost. This creates incentives for the TSO to look for ways to reduce investment costs. The evidence on actual costs will then be used by ERO in determining approved investment costs in future regulatory periods.

The TSO may substitute alternative higher-cost projects for an approved investment project, where this will deliver greater net benefits for customers. In such cases, the TSO may apply to ERO for pre-approval of the substitution. If pre-approval is given, the completed project will be included in the opening RAB for the next regulatory period at the new approved cost. No change will be made in the allowed revenues for the current regulatory period.

Pre-2006 assets, which are currently valued at zero for regulatory purposes, will be included in the opening RAB for the first regulatory period at a positive value for those assets which are used and useful. Other assets commissioned between 2006 and the start of the first regulatory period will be added to the value of these assets to determine the initial RAB value as at 1 April 2012 (the first year in which the new pricing rule will apply). ERO will separately consult on the appropriate valuation of these assets.

## 3.3 Regular adjustments

The initial MAR will be split into three parts:

- One part which is fixed.
- One part which varies with the maximum system demand (in MW).
- One part which varies with the volume of energy transported (in MWh).

At the start of each adjustment period (initially set at one year) within the regulatory period, MAR will be updated by:

- Multiplying each component of MAR by the annual change in the applicable Consumer Price Index less an X-factor (a CPI – X adjustment).
- Multiplying those components of MAR linked to system demand and energy transported by the changes in these parameters.

In addition, a volume adjustment will apply. The difference between actual and allowed revenues in the preceding year will be added to MAR. This corrects for differences in revenues resulting from differences in volumes sold.

The X-factor and starting value of MAR will be set together so as equalise the present value of allowed costs and allowed revenues over the period of the price control, taking into account expected efficiency gains over the period. This allows ERO to smooth the profile of allowed revenues

over time to avoid large step changes in either revenues or user charges. The annex to this paper illustrates this calculation.

An extraordinary adjustment may be made to allowed revenues in the event that costs change due to factors outside the control of the licensee (eg, due to a change in law or taxes). Where such a change in costs exceeds a materiality threshold, ERO will adjust the allowed revenues to compensate. The adjustment will only compensate for the change in costs and will not change other parts of the allowed revenues determination.

### 3.4 Use of system and connection charges

The TSO is responsible for developing use of system and connection charging methodologies, which are approved by ERO. The TSO Pricing Rule requires that these follow a statement of principles to be issued by ERO. These principles are expected to include matters such as whether 'deep' or 'shallow'[6] connection charging should be used, whether use of system charges should differ by geographic location within Kosovo and whether charges should be based on demand, contracted capacity, energy or some combination of these. ERO will separately consult on these statements of principle.

The actual charges will be determined by the TSO each year in accordance with the approved methodologies and be set so as to recover the maximum allowed revenues in the year.

### 3.5 Processes and procedures

Periodic reviews will involve the determination of the initial value of MAR and the X-factor to be applied for each regulatory period. The TSO will initially submit a preliminary proposal on the allowed revenues for the forthcoming regulatory period to ERO. Following consultation with the TSO, ERO will prepare and publish a provisional decision. Where this differs from the TSO's preliminary proposal, ERO will identify these differences and provide full justifications. The provisional decision will be subject to a full public consultation process. At the end of this consultation, ERO will issue its final decision.

The periodic review process will commence at least six months ahead of the start of the next regulatory period. ERO's provisional decision will be published at least 50 business days ahead of the start of the next regulatory period and its final decision at least 20 business days ahead.

The TSO may complain to ERO regarding its final decision under the provisions of applicable legislation.. Currently, any complaint is to be made under Article 44 of the Law on the Energy

[6] Deep connection charging is where the user pays both the costs of their direct connection to the grid and the costs of any reinforcements required within the existing network ('deep' investments). Shallow connection charging is where the user pays only the costs of the direct connection.

Regulator which requires the complaint is made no later than two months after the decision is issued. The TSO may also appeal to the competent court.

The regular adjustment should be a mechanical process with no need for regulatory discretion to be applied and no requirements for consultation are envisaged.

# 4 DSO Pricing Rule

The DSO Pricing Rule follows the same approach as the TSO Pricing Rule. There is one significant change:

- As well as peak demand and units distributed, MAR will also be indexed to changes in customer numbers as a driver of DSO costs.

The DSO will have its own loss reduction incentive based on the sharing of the difference between target or allowed losses established by ERO and actual losses.

A transition period will apply to the DSO, recognizing that the planned KEDS transaction will result in a new owner who will require time to fully understand the business and to prepare their proposals for a full periodic review. The first regulatory period will, therefore, last one year (ie, from 1 April 2012 to 31 March 2013). Following this, the second regulatory period starting in 2013 will last five years, as will subsequent regulatory periods.

# 5 Generation Pricing Rule

The Generation Pricing Rule also follows the same approach as the TSO Pricing Rule, with the following differences:

- For Kosovo A and Kosovo B, the calculated allowed costs will include the costs of the associated mining business as long as these remain under common ownership. As and when a lignite supply agreement (LSA) is signed between a new MineCo and KEK / GenCo, the price in that agreement will be used instead.
- A two-part regulated price will be applied with a capacity price (in €/MW) used to recover fixed costs and an energy price (in €/MWh) used to recover variable costs. The vast majority of the costs for Kosovo A and Kosovo B can be expected to be fixed as the capital costs of both the generators and the mining business can be assumed to be fixed relative to lignite and electricity production. This may change following the signature of a LSA, depending on the pricing structure in that LSA. For the Ujmani and Lumbarhdi hydro power plants, the majority of costs are also fixed as fuel costs are effectively zero.
- Provisions on loss allowances are not applicable to Regulated Generators.

The costs of Regulated Generators can be expected to be below the costs of alternative wholesale supplies, including imports. This gives a significant competitive advantage to the PES relative to other suppliers if it is the only supplier able to access the output from these generators. To avoid this distorting the development of the competitive retail market, ERO currently intends to require the PES to make output from Regulated Generators available to other suppliers (eg, through the capacity release schemes envisaged under Article 25 of the Law on Electricity).

This would not need to be reflected in the Tariff Rules but a separate Rule will be required on how these capacity release schemes will operate. ERO will further consult on this and other potential mechanisms to allow customers to benefit from the lower costs of Regulated Generators while not distorting the competitive retail market.

The initial regulatory period for Regulated Generators is proposed to last four years, with the second periodic review taking place for allowed revenues and prices to apply from 1 April 2016. The second and subsequent regulatory periods will last five years. This is done to allow staggering of the various periodic reviews so that only one review will be held in any one year (ie, separately for the TSO, DSO, PES and Regulated Generators) in order to better manage the resulting workload for licensees and ERO.

# 6 PES Pricing Rule

## 6.1 Form of price control

The price control will take the form of a revenue-cap set for five-year regulatory periods. There will be two initial transition periods of one and two years respectively before moving to five-year controls. This will allow the opportunity for any new owner of KEDS to prepare fully for the periodic review and to make any necessary adjustments to the regulatory approach ahead of the start of eligibility for all customers in 2015. The starting value for allowed costs will be determined ahead of each regulatory period at a periodic review.

## 6.2 Determining allowed costs

Allowed costs of the PES are determined as the sum of direct retail costs, wholesale power costs and pass-through costs.

### *6.2.1 Direct retail costs*

Direct retail costs are the sum of operating expenditures of the PES (excluding wholesale power purchase costs and payments to the TSO and DSO), depreciation of PES-owned assets included in its RAB, a retail margin and an allowance for bad debt costs:

- An efficient level of operating expenditures will be determined by ERO at the periodic review.

- The RAB and asset lives used for the depreciation calculation will be determined in a similar manner to that for the TSO and DSO.
- The allowance for bad debt costs will be set a reasonable level (expected to be 2-3%). Differences between the actual level and this allowed level will be borne by the PES.
- The PES will earn a retail margin to compensate it for the risks of its business, to allow a return on its capital invested in the business and to cover the costs of providing working capital.

### *6.2.2 Wholesale power costs*

The wholesale power costs to be recovered by the PES will be established by ERO based on allowed Regulated Generator prices, forecast costs of purchases from other generators and imports, balancing costs[7], and the expected mix of wholesale supplies.

Purchases from generators eligible for Certificates of Origin[8] will be assumed to be made at a price equal to the average cost of wholesale power purchases from other sources, as the difference between actual purchase costs from these generators and the average wholesale power purchase cost is recovered from a separate levy.

Any contracted capacity from Regulated Generators that is in excess of the PES's requirements and any capacity contracted by the PES to meet security of supply obligations, that is also in excess of its requirements, will be made available to other suppliers in accordance with the rules on capacity release to be developed by ERO for this purpose.

Where the PES has contracted capacity from Regulated Generators or from other generators to meet security of supply obligations, but has subsequently released part of this capacity to other suppliers, it will be permitted to recover any difference between the payments received from other suppliers for this capacity and the payments to be made by the PES to generators under its contracts with them. The mechanism for recovery of this difference will be determined by ERO at a later date.

### *6.2.3 Pass-through costs*

Pass-through TSO and DSO costs will be set equal to the MAR for each entity as determined for the year.

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[7] ERO retains the discretion to introduce in future a mechanism to provide incentives on the PES to reduce balancing costs, if it considers these are sufficiently within the control of the PES.

[8] Generators using approved renewable energy sources and eligible to receive a Feed-in-Tariff for their sales.

### *6.2.4 Allocation of allowed costs*

Allowed direct retail costs are allocated between the PES's regulated and unregulated customers in proportion to their share in total weighted customer numbers. The weightings used will reflect the relative direct costs of the PES in providing billing services to individual customers of different types (eg, the costs of managing the billing for a large industrial customer will be higher than those for a single household).

Pass-through wholesale power costs will be allocated between customers in a way that does not distort competition. The exact mechanism has yet to be defined, but is expected to reflect the share of each customer category in total consumption weighted by the marginal cost of energy in each period (so that a higher proportion of wholesale power costs would be allocated to customers whose consumption mainly occurs at peak periods).

The exception to this is that, prior to 1 January 2015, the costs of imports purchased from KEK, less any import subsidies made available to KEK, will be allocated first to non-eligible customers. Wholesale power costs in addition to these costs will then be allocated across all remaining non-eligible customer consumption and all eligible customer consumption.

Pass-through TSO and DSO costs will be allocated between customers in accordance with the structure of TSO and DSO charges.

## 6.3 Export revenues

The PES is encouraged to export energy supplied by capacity contracted to it which is in excess of its immediate requirements. The PES will be entitled to retain a share (initially expected to be set at 50%) of any difference between the price earned by such exports and the costs of purchasing the energy exported. The remaining difference will be deducted from allowed costs.

To ensure that this does not conflict with the PES's obligations to supply, a general prohibition on exporting when there is unmet demand among the PES's customers will be included in its licence. In addition, if the PES exports in periods when there is load-shedding due to inadequate generation, then it will be subject to an export penalty for all exported volumes. The penalty will be set at a level above the import price, in order to discourage such exports.

## 6.4 Regular adjustments

Within each year of the regulatory period, the initial value of allowed costs will be updated as follows:

- Direct retail costs – indexed to consumer price inflation and an X-factor.
- Wholesale power costs – Regulated Generator prices will be rest to equal MAR for these entities in the coming year. Other prices will be indexed to a measure of wholesale electricity

prices (eg, European Energy Exchange prices[9]). ERO will retain the option to adopt an alternative means of establishing prices where it considers that indexed prices fail to reflect a reasonable expectation of wholesale market prices for the coming year.

- TSO and DSO costs – reset to equal MAR for each entity in the coming year.

In addition, the following adjustments will apply:

- Volume adjustment – the difference between actual and allowed revenues in the preceding year will be added to MAR. This corrects for differences in revenues resulting from differences in volumes sold.

- Wholesale power adjustment – the difference between allowed and actual wholesale power costs in the preceding year will be added to MAR. This ensures that the PES will recover its actual wholesale power costs in full (except for the wholesale energy margin – see below), with a one-year lag. Revenues from the levy for renewable energy generation purchase costs will be excluded.

- TSO and DSO pass-through costs adjustment – the difference between allowed and actual TSO and DSO costs in the preceding year will be added to MAR. This ensures that the PES fully recovers these costs.

In order to provide an incentive for the PES to procure economically from non-regulated sources and to manage its portfolio of generation and import contracts efficiently, a wholesale energy margin is also added to MAR. The margin is calculated as a percentage of the difference between actual power purchase costs in each of the two preceding years. If actual power purchase costs are falling then the margin is positive and MAR increases. If they are rising then the margin is negative and MAR is reduced. The PES, therefore, gains if it reduces actual power purchase costs. The level of exposure of the PES under the margin will be small, to ensure its financial viability is not endangered. This will be achieved by setting the percentage used to calculate the margin at a very low level (eg, 5%).

The regular adjustment should be a mechanical process with no need for regulatory discretion to be applied.

In addition, there is provision for extraordinary tariff adjustments as for the TSO.

## 6.5 Regulated retail tariffs

Regulated retail tariffs will be set to recover the share of allowed costs allocated to customers supplied under regulated tariffs. Tariffs for each customer group will be based on the cost of service to each group and take account of the marginal wholesale energy and capacity costs of supply at

[9] Available from www.eex.com.

different times of year and day (using a study to be commissioned by ERO). Any cross-subsidies will be eliminated by 31 December 2014.

ERO will also assess the effectiveness of existing and planned subsidy mechanisms to protect vulnerable customers. Based on this, it will assess the need, if any, for cross-subsidies within the residential customer category.

## 6.6 Processes and procedures

The processes and procedures for periodic reviews and regular adjustments will follow those for the TSO.

# *Annex 1 Operation of the pricing rules*

This annex provides a simplified example of the operation of the pricing rules. The example is applicable to the TSO, DSO, Regulated Generators and the direct retail costs of the PES. The input values have been deliberately chosen to permit simple calculations and should not be considered to represent values attributable to any individual licensee. Losses are not included in this example.

## Determining allowed costs

### *Operating expenses*

Operating expenses are assumed to be initially set at €20 million for year t (the first year of the regulatory period) and to fall by an efficiency gain of 2% annually. In year t+1, therefore, the allowed operating expenses would be €19.6 million (calculated as €20 million * (1 – 2%)).

### *Opening RAB*

The opening RAB is determined as the opening RAB at the start of the previous regulatory period, updated for inflation since that date, approved additions to the RAB over the previous period, sales of assets over the period and depreciation over the period.

For example, the opening RAB in year t-5 (the start of the previous regulatory period) was €75 million. The economic life of these assets is 25 years. The approved capital investments over the previous period were €40 million. Inflation over the period has averaged 2.8% annually or a total of 15% over the five-year period to year t.

The opening RAB for the new regulatory period, starting in year t, is therefore calculated as:

***Figure 1: Determining the opening RAB***

| | | **€ millions** |
|---|---|---|
| Opening RAB in year t-5 | | 75 |
| Depreciation | *1/25pa for 5 years* | -15 |
| Approved additions | | 40 |
| **Opening RAB in year t, at year t-5 prices** | | **100** |
| Inflation index, year t-5 to year t | *2.8% pa for 5 years* | 1.2 |
| **Opening RAB in year t, at year t prices** | | **120** |

### *Capital expenditures*

Capital expenditures included in allowed costs are approved by ERO, based on an investment plan provided by the licensee. For simplicity, it is assumed in this example that approved capital expenditures in each year equal €25 million and that the resulting projects are commissioned in the year in which the expenditures are made. It is also assumed that all investments are financed through debt and internal cash flows with no grant financing, so that RAB and RABf are equal.

### *Depreciation*

Depreciation is calculated on a straight-line basis using an assumed 25-year economic life for all assets.

### *WACC*

The WACC is calculated using an estimated real cost of equity of 12%, an assumed actual real cost of debt financing of 5%, a corporate tax rate of 10% and a gearing of 50%. The calculation is shown below.

***Figure 2: Calculating WACC***

| | | |
|---|---|---|
| Post-tax cost of equity (real) | re | 12.0% |
| Corporate tax rate | t | 10.0% |
| Pre-tax cost of equity | re / (1 - t) | 13.3% |
| Actual cost of debt (real) | rd | 7.5% |
| Gearing | g | 0.50 |
| **WACC = g * rd + (1 - g) *[ re / (1 - t)]** | | **10.4%** |

### *Allowed costs*

The allowed costs are determined for each year of the regulatory period as the sum of operating expenses, depreciation and allowed return (calculated as WACC multiplied by the average RAB value for the year), as shown below.

***Figure 3: Calculation of allowed costs***

| *All € millions* | | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
|---|---|---|---|---|---|---|---|
| Operating expenses | | | 20.0 | 19.6 | 19.2 | 18.8 | 18.4 |
| | Efficiency factor | -2.0% | | | | | |
| Regulated asset base (RAB) | | | | | | | |
| Opening value | | | 120.0 | 140.2 | 159.6 | 178.2 | 196.1 |
| Depreciation | | | -4.8 | -5.6 | -6.4 | -7.1 | -7.8 |
| Additions | | | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 |
| Closing value | | | 140.2 | 159.6 | 178.2 | 196.1 | 213.2 |
| | Asset life (years) | 25 | | | | | |
| Allowed return | | | | | | | |
| | WACC | 10.4% | 13.6 | 15.6 | 17.6 | 19.5 | 21.3 |
| **Allowed costs** | | | **38.4** | **40.8** | **43.2** | **45.4** | **47.6** |

## Conversion to allowed revenues

Over the period of the price control, the present value of allowed revenues (discounted at the allowed WACC) must equal the present value of allowed costs. However, it is not necessary for the two to be equal in any single year within the period[10], providing scope to adjust revenues (and, thereby, tariffs) to smooth changes.

ERO will determine the path for allowed revenues by setting the initial value of MAR and the X-factor used to adjust the real value of MAR in each year (using the generic formula *MARt = MARt-1 * (1 + CPI – X)*). As an example, we assume that ERO chooses to set the starting MAR at €35 million (ie, below the allowed costs in the first year). It can then calculate the X-factor necessary for the present value of allowed costs and allowed revenues to be equal over the period (which, in this case, would be -10.9%, ie, allowed revenues will increase by 10.9% annually in real terms). This is illustrated below.

[10] The licensee is assumed to be able to cover shortfalls in early years by borrowing against the higher revenues in later years, or vice-versa.

*Figure 4: Calculation of MAR and X-factor*

| *All € millions* | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Total |
|---|---|---|---|---|---|---|---|
| Discount factor | | 1.000 | 0.906 | 0.820 | 0.743 | 0.673 | |
| Allowed costs | Undiscounted | 38.4 | 40.8 | 43.2 | 45.4 | 47.6 | |
| | Present value | 38.4 | 37.0 | 35.4 | 33.8 | 32.0 | **176.5** |
| MAR | Undiscounted | 35.0 | 38.8 | 43.0 | 47.7 | 52.9 | |
| | Present value | 35.0 | 35.2 | 35.3 | 35.5 | 35.6 | **176.5** |
| X-factor | | -10.9% | | | | | |

## Regular adjustments

At its simplest, the regular adjustments consist of increasing the MAR from the previous year by the various cost drivers and by inflation plus the X-factor. For example, assume that the defined cost drivers are peak demand served (D, measured in MW) and units transported (E, measured in MWh). The weightings applied are as follows:

Fixed factor (a) = 0.5

Peak demand factor (b) = 0.25

Units transported factor (c) = 0.25

In year t (the current year) and t-1 (the previous year), the respective values are as follows:

| | **Year t** | **Year t-1** | **Change** |
|---|---|---|---|
| Peak demand (MW) | 500 | 525 | +5% |
| Units transported (MWh) | 2,000 | 2,200 | +10% |

The calculation of MAR in year t is then as follows:

*Figure 5: Calculation of regular adjustment*

| | | € millions |
|---|---|---|
| At = a * MARt-1 * (1 + CPIt – X) | = 0.5 * 35 * (1 + 2.5% +10.9%) | 19.8 |
| Bt = b * MARt-1 * (1 + CPIt – X) | = 0.25 * 35 * (1 + 2.5% +10.9%) | 9.9 |
| Ct = c * MARt-1 * (1 + CPIt – X) | = 0.25 * 35 * (1 + 2.5% +10.9%) | 9.9 |
| **MARt = At + Bt * (Dt/Dt-1) + Ct * (Et/Et-1)** | **= 19.8 + 9.9 * (525 / 500) + 9.9 * (2200 / 2000)** | **41.2** |