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## Revenue and Tariffs Model (RTM) User Guide

2008

### DISCLAIMER

This Guide has been prepared for information purposes only. Nothing contained in this Guide or the Revenue and Tariffs Model should be considered to represent a decision by ERO unless explicitly stated otherwise.

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## 1 Introduction

The Energy Regulatory Office (ERO) has developed a Revenue and Tariffs Model (RTM) to assist it in the collection and analysis of data relating to price reviews (used to determine allowed revenues) and proposed regulated tariffs for energy enterprises in Kosovo. This User Guide explains the purpose of each module and identifies user inputs and controls. Two attachments provide additional detail on how the RTM determines the appropriate allowed revenues and the appropriate level and structure of allowed tariffs.

## 2 Model structure

The RTM consists of a number of sheets, which can be grouped into modules as follows:

Module	Sheet title	Purpose
	Cover	n/a
<b>Outputs</b>	RetailPublish	Calculated retail tariffs for publication
(Pink colour sheet tabs)	DUOSPublish	Calculated distribution use of system (DUOS) charges for publication <sup>1</sup>
	TUOSPublish	Calculated transmission use of system (TUOS) charges for publication
	Analysis	Analysis of changes in average tariffs and residential bills under calculated tariffs
	RevSummary	Comparison of allowed revenues under calculated tariffs with previous years and proposals
	IAS-P&L	Projected Profit & loss (income) statements for KEK and KOSTT under calculated tariffs, in International Accounting Standards (IAS) format
	IAS-BS	Projected Balance Sheets for KEK and KOSTT under calculated tariffs, in International Accounting Standards (IAS) format
	IAS-Cflow	Projected Cash Flow statements for KEK and KOSTT under calculated tariffs, in International Accounting Standards (IAS) format
<b>Inputs</b>	InputPhysical	Input assumptions and data on physical parameters for tariff calculation
(Grey colour sheet tabs)	InputCost	Input assumptions and data on financial parameters for tariff calculation
	Energy Bal	Input assumptions and data on energy balance
	Power Costs	Input assumptions and data on power purchase costs
<b>Allowed Revenues</b>	Mining	Input of operating and capital costs and calculation of allowed costs

<sup>1</sup> These are not currently separately distinguished and published. However, as and when the definition of eligibility is extended to include distribution-connected customers, it will become necessary to establish separate DUOS charges.

## Model structure

Module	Sheet title	Purpose
		for KEK's mining business
(Yellow colour sheet tabs)	Gen	Input of operating and capital costs and calculation of allowed costs for KEK's generation business
	Dis	Input of operating and capital costs and calculation of allowed costs for KEK's distribution business
	Supply	Input of operating and capital costs and calculation of allowed costs for KEK's retail supply business
	HQ	Input of operating and capital costs and calculation of allowed costs for KEK's headquarters. These costs are allocated across other KEK divisions in proportion to their share of total KEK non-HQ staff
	KOSTT	Input of operating and capital costs and calculation of allowed costs for KOSTT
Tariffs	Interface – Tariffs	Restatement of allowed costs in format suitable for calculation of allowed tariffs
(Blue colour sheet tabs)	LRMC	Calculation of long-run marginal cost (LRMC) at each distribution voltage level (used in calculation of DUOS charges)
	LAF	Calculation of loss adjustment factors (LAF) at each voltage level (used in calculation of TUOS and DUOS charges)
	AllocFactors	Allocation of energy-, demand- and customer-dependent costs across tariff categories (using inputs from InputPhysical sheet)
	Cost Alloc	Allocation of energy-dependent costs by season (high/low) and time of day (high/low) (using inputs from InputPhysical sheet)
	Retail Tariff	Conversion of allocated costs into retail tariffs for each tariff category
	HH Block Tariff	Conversion of average retail tariffs for residential customers into block tariffs
	DUOS Tariff	Calculation of separate DUOS charges using allocated costs
	CostReflecTariffs	Cost-reflective retail tariffs based on allocated costs (calculated from preceding sheets)
	AdjFactors	User-defined adjustments to cost-reflective retail tariffs (eg, to prevent excessive increases in individual tariffs)
	AdjTariffs	Calculated retail tariffs following user-defined adjustments
	Sales	Sales volumes under each individual retail tariff (using inputs from InputPhysical sheet)
	Revenues	Calculated revenues under adjusted retail tariffs
	TUOS Charges	Calculated TUOS charges
Financial	Interface – Fin	Restatement of allowed costs and calculated revenues in format suitable for calculation of financial statements
(Green colour sheet tabs)	KEK Rev+Cost	Allocation of KEK allowed costs and calculated revenues by accounting categories
	KOSTT Rev+Cost	Allocation of KOSTT allowed costs and calculated revenues by accounting categories
	Fin Check	Cross-check that allocated costs and revenues match allowed and calculated
	VAT	Calculation of VAT liabilities for purposes of presenting financial accounts
	Financing	Calculation of debt service liabilities given assumed borrowing

## Model structure

Module	Sheet title	Purpose
		requirements
	Classic-P&L	Projected Profit & loss (income) statements for KEK and KOSTT under calculated tariffs, in classic format
	Classic-BS	Projected Balance Sheets for KEK and KOSTT under calculated tariffs, in classic format
	Classic-Cflow	Projected Cash Flow statements for KEK and KOSTT under calculated tariffs, in classic format

The model requires data to be entered for each of the following years (where T is the Tariff Year currently under review<sup>2</sup>):

- **T-2 actual**— this represents the actual sales, costs and revenues incurred in the previous Tariff Year but one. It is used as a check on the reasonableness of cost submissions by energy enterprises.
- **T-1 allowed**—this represents the projected sales and allowed costs and tariffs as determined by ERO for the previous Tariff Year. It allows identification of large changes from previously allowed values that may require further investigation.
- **T-1 actual**—this represents the actual sales, costs and revenues incurred in the previous Tariff Year<sup>3</sup>. It is used as a check on the reasonableness of cost submissions by energy enterprises.
- **T requested**—this represents the cost and tariff submissions by the energy enterprises for the Tariff Year, as subsequently amended by ERO following analysis.
- **T+1 indicative**—this represents indicative estimates of sales, costs and revenues in the subsequent Tariff Year. For annual price reviews, this is used to allow analysis of longer-term trends and any implications from decisions on allowed costs in the current year for future years (eg, from the postponement of capital expenditures). For three-year price reviews (where performance-based rates are applied), this is used to enter cost submissions for the middle year of the three-year period.
- **T+2 indicative**—this represents indicative estimates of sales, costs and revenues in the year after the subsequent Tariff Year. For annual price reviews, this is inactive and default data is

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<sup>2</sup> For example, if tariffs are being determined for the 2008 Tariff Year, then T = 2008, T-1 = 2007 and T+1 = 2009.

<sup>3</sup> Where the Tariff Year starts on 1 January then actual data will only be available for the first nine months of each year with the remaining three months having to be estimated.

## Data entry

entered (currently, this is set equal to the values for the preceding year). For three-year price reviews (where performance-based rates are applied), this is used to enter cost submissions for the last year of the three-year period.

### 3 Data entry

Data entry is colour-coded. Initially, data should only be entered in **unshaded** cells. Data entered by KEK or KOSTT should then be separately colour-coded to allow it to be easily distinguished from data entries by ERO. KEK data entries should be colour-coded as **green** cells and KOSTT data entries as **blue** cells.

The following sections summarise the main user-defined entries under each module and sheet.

### 4 Outputs module

This module provides various reports in a format suitable for publication by ERO. Unlike other modules, **unshaded** cells do not indicate data entry locations—these are left unshaded to make them suitable for copying and pasting into consultation papers and other ERO documents. No data entries should be made in these sheets.

### 5 Inputs module

The inputs module is used to enter the main assumptions and data used for the purposes of calculating allowed revenues and tariffs (particularly cost allocation).

#### 5.1 *InputPhysical sheet*

This sheet is used to enter the key data on sales by customer and charge type which, in turn, is used to allocate allowed costs between customer categories and tariffs and to calculate sales and revenues under the resulting tariffs.

Category	Data	Content
Base year		This sets T-1 (see above)
Demand	Coincident demand	The demand attributed to each customer category at each voltage level at the time of annual system peak demand
	Load duration	The number of hours required for each customer category, if consuming at coincident peak demand in each hour, to reach total annual consumption (eg, if coincident peak demand is 100MW and annual consumption is 100GWh then load duration would be 1,000 hours = 100GWh / 100 MW)
	Chargeable demand	The demand attributed to each customer category for billing purposes. Charges are applied to non-coincident peak demand recorded in each month, which may be greater than coincident

## Inputs module

Category	Data	Content
		peak demand (demand at system peak). Peak demand levels will also change from month to month. This is not, therefore, the same as coincident peak demand $t^* 12$ months
Consumption	Consumption by category	Total sales by tariff customer category, in volume terms and as a percentage split
	Consumption by period	The proportion of energy sales by customer category that occurs in each of the four charging periods (winter low and high / summer low and high)
	Consumption by block	The proportion of residential energy sales occurring in each tariff block. If a separate tariff is not calculated for social cases, then the sales to this block should be set at zero <sup>4</sup>
Customers	Customer numbers	The number of customers in each category (annual average)
	Unmetered customers	The number of unmetered household customers allocated to each tariff block
	Customer allocation factor weightings	The costs of metering, billing and collection (MBC) costs of each customer category relative to those for household customers with 2-rate meters (customer category 5). For example, a weighting of 6 implies that a customer category's MBC costs are 6 times those for category 5 customers and, as a result, the proportion of customer-related charges allocated to them should be 6 times greater
Reactive power <sup>5</sup>	Metered reactive power	The total quantity of metered reactive power sales at each voltage level
	Allocation of reactive power costs	The split of total reactive power costs between voltage levels (currently proportional to metered sales)
	Allocation of reactive power costs between customer categories	The share of reactive power costs at each voltage level allocated to each customer category (eg, 100% of reactive power costs allocated to the 10kV level are, in turn, allocated to category 3 customers – 0.4kV commercial with reactive power metering)
Network data	Network losses	The quantity of energy lost between entry to and exit from each voltage level. This is used for allocation of losses between customer categories only and may not equal allowed losses as shown in the <i>Energy Balance</i> sheet
	Proportion of 10kV demand transiting 35kV network	This is the assumed proportion of demand on the 10kV network that is supplied via the 35kV network rather than directly from the 110kV network (transmission). This is used to attribute a share of 35kV network costs to customers connected at 10kV and below

<sup>4</sup> Where a social cases subsidy is directly paid by Government, there is no need to create a separate tariff block for these customers. Instead, they are billed as normal, but their bills are paid by Government.

<sup>5</sup> Currently, due to concerns over the appropriateness of the reactive power cost allocation provisions in the RTM, these entries are not used to determine reactive power charges. Instead, reactive power charges are externally entered into the *InputCost* sheet.

## 5.2 InputCost sheet

This sheet is used to input non-physical data used for the purposes of allocating costs between customer categories and tariffs.

Category	Data	Content
Split of allowed revenues	Capacity costs as % of total costs	This represents the assumed share of capacity costs in total wholesale (generation + imports) power purchase costs, which is subsequently used to allocate these costs between demand and energy charges. The current values were established during ETR1
Revenue-adjusted SRMC		This represents the assumed short-run marginal costs (SRMC) of wholesale power supply in each tariff period <sup>6</sup> . This is set as the average of the variable cost of the marginal supplier (generating unit or imports) in each hour of the tariff period. The calculation was carried out under ETR1 and kept unchanged for ETR2
Demand-energy adjustment factors	DUOS tariffs	This splits the demand (capacity)-dependent share of distribution costs between the part allocated to demand charges and allocated to energy tariffs for distribution-connected industrial and commercial customers <sup>7</sup> . Entering 100% allocates all these costs to demand charges, entering 0% allocates them all to energy charges and values inbetween allocate them proportionally
	Retail tariffs	This allows for the user to define what share of non-customer and non-reactive power costs (ie, all wholesale power purchase and network costs) is allocated to demand and what to energy charges in the final retail tariffs for distribution-connected industrial and commercial customers <sup>8</sup> . Entering 100% allocates all these costs to demand charges, entering 0% allocates them all to energy charges and values inbetween allocate them proportionally <sup>9</sup> . Entering >100% means that these costs are allocated in the proportions calculated within the RTM
High to low period tariff ratios		This allows the user to impose a ratio of high to low period energy tariffs (winter high to winter low and summer high to summer low) rather than leaving these to be calculated within the RTM (in

<sup>6</sup> SRMC represents the marginal cost of wholesale energy purchases in each tariff period. The relative SRMC, therefore, represent the relative costs of energy purchases to meet demand in each period and, in principle, the relativity that should exist between energy charges (before adjustments for losses) in each tariff period.

<sup>7</sup> No demand charge applies to household customers and, therefore, all distribution costs allocated to these customers are recovered through energy charges.

<sup>8</sup> No demand charge applies to household customers and, therefore, all costs allocated to these customers are recovered through energy charges.

<sup>9</sup> At present, a value of 0% is only entered for small commercial customers without reactive power metering (Category 4) for whom demand charges are not applied.

Category	Data	Content
		proportion to relative costs of supply in each period). This option is only available for smaller commercial and household customers with two-rate metering who ERAV may wish to protect against sudden changes in tariff relativities. Entering a value of 0 means that relative energy tariffs are calculated within the RTM <sup>10</sup>
Household block adjustment factors		These are used to set the subsidy contained in the energy tariff for each block (customer charges are the same for all household customers in each category). Entering -30%, for example, means that energy tariffs in that block are set 30% below the average energy tariff for that household customer category, with tariffs in the top block being correspondingly increased to make up the shortfall in revenues
Collection rates	Allowed collection rate	This is the collection rate applied for the purposes of determining allowed costs and tariffs. Entering 100% means no recovery of under-collections through higher tariffs is allowed
	Actual collection rate	This is the actual / assumed collection rate, used in preparing the financial projections in the RTM
Cost-reflective reactive power cost		This allow the user to directly enter a reactive power tariff as an alternative to this being calculated within the RTM <sup>11</sup>

### 5.3 Energy Bal sheet

This sheet is used to construct the energy balance used in calculating power purchase costs, losses and sales. The construction of the balance follows differing approaches depending on whether historic or forecast data is being used:

- For T-2 and T-1, where power purchases are known, the balance is calculated on a top-down basis. The user enters power purchases (generation and imports), losses and sales to transmission-connected customers. The RTM then calculates sales to distribution-connected customers as a residual.
- For forecast years (T to T+2), the balance is calculated on a bottom-up basis. The user enters sales to distribution and transmission-connected customers, losses and power purchases from generators located within Kosovo. The RTM then calculates purchases from imports as a residual.

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<sup>10</sup> At present, a value of 2 has been entered for both customer categories. This means that the existing relativities (where high period tariffs are two times those for the corresponding low period) are retained, even where the RTM calculates an alternative ratio as being more cost-reflective.

<sup>11</sup> This is the approach currently applied, in order to avoid the apparently anomalous results that the RTM calculation delivered

## Inputs module

Category	Data	Content
Generation		This is used to enter actual / forecast power purchases from generators located within Kosovo (KEK-owned and IPPs)
Imports and exports	Imports – transit	This is used to enter expected transit flows entering Kosovo
	Imports – purchases by KEK Supply	For earlier years (T-1 and T-2), this is directly entered as total purchases in the form of imports by KEK Supply to meet demand in Kosovo. In forecast years (T onwards), it is calculated within the RTM as the residual required to balance Kosovan supply and demand
	Transit losses	These are assumed losses associated with transit flows (compensated under the inter-TSO mechanism)
	Exports – transit	These are transit flows existing Kosovo, calculated as transit flow imports less transit losses
	Exports – sales by KEK Supply	These are export sales by KEK Supply of energy purchased from generators located within Kosovo
Transmission	Transmission Loss Factor (TLF)	This is the actual / allowed transmission losses. It is calculated in accordance with the Interim Market Rules <sup>12</sup> . For earlier years (T-1 and T-2), actual transmission losses are entered (as GWh) and the TLF is calculated from these. For forecast years (T onwards), an allowed TLF is entered and transmission losses calculated from this
Transmission load	Sales to transmission-connected customers	These are direct sales to customers connected to the transmission network (110kV and above), both eligible and non-eligible
	KEK consumption	This is own use of energy by KEK (for example, in mining operations) for which no payment is made
Distribution load	Distribution losses – technical	These are expressed as a percentage of total energy entering the distribution network
	Distribution losses – non-technical	These are expressed as a percentage of total energy entering the distribution network. They include losses due to theft and mis-billing, but not collection losses
	Sales to distribution-connected customers	These are final sales to distribution-connected customers. For earlier years (T-1 and T-2) they are calculated as a residual

### 5.4 Power Costs sheet

This sheet is used to enter the assumed costs of wholesale power purchases. For KEK Generation, these are calculated within the RTM and applied as an assumed internal transfer price. Other costs are directly entered into the RTM as an average price per MWh.

<sup>12</sup> The TLF is calculated as the sum of metered energy entering the transmission network to serve Kosovan demand (transmission-connected generation located within Kosovo plus net imports) divided by metered energy existing transmission in Kosovo (sales to transmission-connected customers, KEK own consumption and entering the distribution network). This definition means that transit losses, which cannot be separately distinguished, are included in the TLF. The costs of transit losses should be subsequently recovered through the Inter-TSO Compensation mechanism, the net proceeds from which are used to reduce future TUOS charges.

## Allowed revenues module

The weighted average power purchase cost (WAPPC) used for calculating the costs of losses purchased by KEK Distribution and KOSTT in row 35 should generally be equal to the WAPPC for the system as a whole, calculated in row 32. To avoid circularity, it is necessary to copy and paste (as values) this system-wide WAPPC into the WAPPC used for calculating losses purchases.

## 6 Allowed revenues module

The various sheets calculating allowed revenues all follow the same format. Much of the calculation is carried out within the RTM based on data and assumptions entered into other sheets. Only those items directly entered by the user on these sheets are described below.

Category	Data	Content
Memorandum items	Employees	The number of employees in that division (where part of KEK). This is used to allocated HQ costs between operating divisions
Operating expenditures		These are the actual / requested / approved operating costs for each division and KOSTT. These are obtained from submissions by the energy enterprises. Costs of fuel purchases and power purchases are calculated within the RTM
Capital expenditures	Consolidated capital expenditures	These are the total actual / requested / approved capital expenditures for each division and KOSTT within the year. At present, capital expenditures are added to the Regulatory Asset Base (RAB) in the year in which they are incurred. These approach may be changed in future
	Financing – grants	This is the actual / assumed grants available from the Kosovo Consolidated Budget (KCB) and donors for capital expenditures in each year
	Financing – donor / KCB loans	This is the actual / assumed loans available from the Kosovo Consolidated Budget (KCB) and donors for capital expenditures in each year
	Financing – other sources	This is the remaining capital expenditures, not financed from grants or KCB / donor loans and which is assumed to be commercially financed
Depreciation and allowed return	Weighted average asset life	This is the weighted average life of the assets of each energy enterprise—used to calculate depreciation allowances
	Weighted average cost of capital	This is the assumed commercial cost of funding for the energy enterprise. For annual price reviews, it should be entered as a nominal value. For multi-year price reviews, it should be entered as a real value and the RAB updated with inflation
Conversion to allowed revenues	Non-regulated sales – other	These are revenues earned from non-regulated activities not already calculated within the RTM (exports and sales to eligible customers). Non-regulated activities are considered to be all those not subject to price regulation (ie, activities other than those related to the sale of electricity to regulated final customers)
	Subsidies – fuel purchases and imports	These are subsidies paid from KCB to help fund the costs of fuel purchases and imports. They are assumed to be paid to KEK Supply
	Subsidies – social cases	These are subsidies paid from KCB to cover the bills of customers designated as social cases. They are included for information only

Category	Data	Content
		and do not affect the allowed costs calculation <sup>13</sup>
Smoothing adjustment		This is a one-off adjustment used to correct for the change from multi-year to annual price reviews between ETR <sub>1</sub> and ETR <sub>2</sub> . It adds back the (interest-adjusted) deduction in allowed revenues applied in the first year of the multi-year price control set under ETR <sub>1</sub> , as part of the smoothing of allowed revenues over that price control period

## 7 Tariffs module

Within this module, user entries are required in the *LRMC*, *LAF*, *AdjFactors* and *TUOS Charges* sheets.

### 7.1 LRMC sheet

Within this sheet, the user is required to enter the necessary data to calculate the long-run marginal cost (LRMC) of the distribution network at each voltage level. This is used to allocate capacity (demand) related distribution costs between voltage levels and customer categories.

Category	Data	Content
Cascaded LRMC	Coincidence factor	The coincidence between each customer category's annual peak demand and that for the distribution system as a whole. For example, a coincidence factor of 0.95 means that demand for that customer category at the time of system peak demand is 95% of the maximum annual demand for that customer category
LRAIC calculation	Average asset life	The average asset life used for calculating an annuity in the LRMC calculation
	Incremental load	The incremental (additional) load at each voltage level in each year (eg, 30 MW means peak demand (load) is 30MW higher than in the previous year)
	Investments	The investments made in the distribution network at that voltage level in each year. Ideally, these will be investments required to meet demand growth only. The present value of these investments (discounted by at the weighted average cost of capital of the distribution business) divided by the present value of the incremental load served gives the long-run average incremental cost (LRAIC) at each voltage level—the average cost of new investments per unit of additional load served
LRMC by voltage level	O&M costs	The annual assumed unit operating and maintenance costs (for a new assets). These are added to the annuity of the LRAIC to obtain the LRMC at each voltage level

<sup>13</sup> From the perspective of KEK Supply, it is irrelevant whether a bill is paid by the customer or on their behalf from KCB. What is important is that the bill is paid

## **7.2 LAF sheet**

In order to calculate losses at each voltage level (used in attributing costs of losses across customer categories), the user needs to enter losses (broken down by technical and commercial losses) and sales at each network and substation voltage level. This data is entered for a sample year—consequently, the total calculated losses and sales do not necessarily match those in the *Energy Bal* sheet.

## **7.3 AdjFactors sheet**

This sheet is used to allow the user to modify the cost-reflective tariffs calculated in the RTM to take account of other objectives and constraints (eg, an extended transition to new tariff levels or to address affordability concerns). This is done by entering, for each tariff and customer category, a factor by which the cost-reflective tariff is multiplied to give the final retail tariff. Entering a factor of 1 retains the cost-reflective tariff, a factor >1 results in a retail tariff exceeding the cost-reflective level and a factor <1 a retail tariff below the cost-reflective level.

## **7.4 TUOS Charges sheet**

To allow calculation of TUOS charges at differing voltage levels and of system operator (SO) and market operator (MO) charges, the user needs to enter the split of allowed revenues not related to the MO, purchases of ancillary services or losses between the two transmission voltage levels (400kV and 220/110kV) and the SO. The user also needs to enter total assumed MO allowed revenues, which then allows calculation of SO and network allowed revenues and charges.

# **8 Financial module**

User entries are related to the determination of VAT liability for the calculation of financial statements and of assumed default loan terms for the purposes of calculating interest payments and loan repayments in these statements.

## **8.1 KEK Rev+Cost sheet**

The user needs to identify which revenues earned by KEK are liable for VAT (rows 16:22) and which costs are liable for VAT, as well as the proportion of each cost item on which VAT is assumed to be charged (rows 172:178).

## **8.2 KOSTT Rev+Cost sheet**

The user needs to identify which costs are liable for VAT, as well as the proportion of each cost item on which VAT is assumed to be charged (rows 49:55).

### **8.3 VAT sheet**

The user needs to enter the VAT rate, default proportion of operating costs liable for VAT and the period over which VAT liability is measured and payments made.

### **8.4 Financing sheet**

The user needs to enter the assumed interest rate and term of loans to the energy enterprises.

## Attachment 1: Allowed Revenues Calculation in the RTM

### Calculation of allowed costs

#### *General approach*

The Tariff Methodology established the following key principles for the calculation of allowed costs of regulated businesses:

- Allowed costs are calculated under a 'building block' approach, where the total allowed costs are equal to the sum of efficient *operating expenditures (opex) + depreciation + allowed return*.
- Depreciation and allowed return are calculated with reference to a *regulatory asset base (RAB)*.
- Assets for which the licensee incurs no financing costs are not included in the calculation of the allowed return. The regulatory asset base used for this calculation is, therefore, calculated as *RAB less the value of 'free' assets (RABf)*. Free assets are defined as those assets:
  - Purchased prior to 2006 and which were, therefore, either inherited from the pre-1999 regime<sup>14</sup> or financed from subsequent grants made available to the industry.
  - Purchased in 2006 and subsequently using grants made available to the industry.
- The allowed return is calculated as a *pre-tax weighted average cost of capital (WACC) \* RABf*. The WACC used for this purpose represents ERO's estimate of the financing costs of an efficient business, rather than the actual financing costs of the licensee.
- All assets in the RAB are included in the calculation of allowed depreciation. For this purpose, a *weighted average remaining asset life* is applied. This is calculated from the statutory accounts.
- Allowed efficient *capital expenditures (capex)* are added to the RAB in the year in which they occur<sup>15</sup>.

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<sup>14</sup> If, following final status negotiations, licensees are required to either make compensating payments for these assets or assume part or all of existing loans used for the purposes of purchasing these assets, then ERO has committed to allowing an appropriate share of these costs to be included in the allowed revenues to be recovered from regulated tariffs.

<sup>15</sup> For the purposes of calculating the depreciation allowance and allowed return, the average of the opening and closing RAB for the year is used.

**Retail supply costs**

The exception to this approach is the calculation of the allowed (non-power purchase) costs of KEK Supply. The costs of this business are calculated as:

- A *retail cost*, expressed as a cost per customers, to compensate for the customer account management costs assumed by KEK Supply.
- A *supply margin*, expressed as a percentage of power purchase costs passed-through to regulated customers, to compensate for market risks assumed by KEK Supply and its working capital needs.

Bad debts are not considered a legitimate cost of KEK Supply and are not included in the allowed costs for this business.

**Power purchase costs**

The allowed power purchase costs of KEK Supply are calculated as:

- Allowed costs of KEK Mining, calculated as above
- plus*
- Allowed costs of KEK Generation, calculated as above (excluding the costs of fuel purchases from KEK Mining)
- plus*
- Projected power import costs
- plus*
- Allowed costs of ancillary services purchases by KOSTT
- less*
- Allowed costs of losses paid by KOSTT and KEK Distribution

**Losses**

KOSTT and KEK Distribution are respectively responsible for the purchase of losses incurred in the transmission<sup>16</sup> and distribution of energy. For this purpose, distribution losses are defined as the difference between metered electricity entering and exiting the distribution network (ie, including theft and other commercial losses).

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<sup>16</sup> Including transit losses.

## Attachment 1: Allowed Revenues Calculation in the RTM

The allowed costs for KOSTT and KEK Distribution include a provision for the purchase of losses. This is calculated as the *weighted average power purchase price \* energy entering the network \* allowed loss rate* (expressed as a percentage).

### ***Ancillary services***

The projected costs of ancillary services are included in the allowed costs of KOSTT.

### ***Allocation of Head Office costs***

KEK Head Office costs are calculated in the same way as those for other businesses. These are then allocated across KEK's individual businesses in proportion to the share of staff numbers in each business.

### **Conversion to allowed revenues**

#### ***Non-regulated activities***

Converting allowed costs to allowed revenues involves the deduction of projected revenues from non-regulated activities from the allowed costs of each business:

- Projected revenues from lignite sales to customers other than KEK Generation deducted from the allowed costs of KEK Mining included in the allowed power purchase costs of KEK Supply.
- Projected revenues from power exports and from sales of energy to eligible customers are deducted from the allowed power purchase costs of KEK Supply.
- Projected revenues from the Inter-TSO Compensation (ITC) mechanism are deducted from the allowed costs of KOSTT.
- Projected revenues from transmission and distribution charges paid by eligible customers are deducted from the allowed costs of KOSTT and KEK Distribution, respectively.
- Projected revenues from connection charges (where these are used to finance new network assets) are deducted from the allowed costs of KOSTT and KEK Distribution, as appropriate.
- Operating subsidies (ie, excluding grants for capital expenditures) paid to KOSTT and KEK from the Kosovo Consolidated Budget (KCB) are deducted from the allowed costs of the appropriate business.

#### ***Corrections and compensating adjustments***

Allowed revenues are also adjusted for:

- Underspends on allowed capex in the preceding period, where the associated investment was not made and is not included in planned investments in the coming period. Where the

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investment is still planned, then no correction is made but no additional capex allowance is provided.

- Differences between forecast and actual revenues and costs in the preceding period, that are outside the control of licensees. These adjustments include:
  - Differences in the costs of purchasing losses by KOSTT and KEK Distribution that result from differences between actual and projected power purchase prices and energy transported (but not due to differences between actual and allowed loss rates).
  - Differences between actual and projected net revenues to KOSTT under the ITC mechanism.
  - Differences between actual and projected operating subsidies paid to KOSTT and KEK from the KCB. The difference is added to allowed revenues.
  - Differences between actual and projected grant funding for new investments paid to KOSTT and KEK from the KCB. The difference is converted from an assumed free asset to an asset eligible to earn a return.

In each case, the difference is multiplied by one plus the one-year lending rate charged by commercial banks in Kosovo. This reflects the assumption that the licensee is either required to borrow to compensate for shortfalls in allowed revenues that are outside its control, or can deposit surpluses and receive a return on these.

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### Structure of retail tariffs

Electricity retail tariffs in Kosovo comprise:

- Standing or customer charges (expressed in €/customer/month). These are used to recover customer-related costs of supply.
- Demand charges, for customers with appropriate metering (expressed in €/kW and applied to peak metered demand in each month). These are used to recover those (fixed) costs of supply driven by peak demand (ie, the provision of networks and generating capacity).
- Energy charges (expressed in €/kWh, with different rates applying in high and low seasons and times of day). These are used to recover variable costs of supply (ie, the fuel costs of generation and the costs of importing power).

- Reactive power charges, for larger customers with appropriate metering (expressed in €/kVAh). These are used to recover the costs of providing reactive power.

### **Calculation of retail tariffs**

The general approach is to allocate allowed revenues into customer-related, demand-related and energy-related costs, depending on the primary cost driver. These costs are then allocated between individual tariff categories in proportion to their share of customer numbers, coincident peak demand and energy volumes respectively (ie, an allocated or embedded costs approach). More detail on the approach taken to calculating each individual charge component is provided below.

#### ***Standing / customer charges***

Standing / customer charges are calculated as follows:

- The standing / customer charge is calculated as allocated customer-related costs divided by the forecast number of customers in each category.
- Allocated customer-related costs are calculated as the total customer-related costs multiplied by each category's share of total customer numbers.
- Total customer-related costs are calculated as the sum of the allowed supply margin and retail costs of KEK Supply attributable to regulated customers.

#### ***Demand charges***

Demand charges are calculated as follows for customers in categories 0-3 (larger industrial and commercial customers):

- The demand charge is calculated as allocated demand-related costs divided by the sum of forecast peak demand for the customer category in each month.
- Allocated demand-related costs are calculated as the total capacity-related costs at each voltage level multiplied by the share of each customer category in coincident peak demand at that voltage level.
- Total capacity costs are calculated as the sum of wholesale power purchase costs multiplied by the assumed proportion of capacity costs<sup>17</sup> in these plus TUOS network infrastructure

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<sup>17</sup> Set at 30% by KEMA (ERO's consultants for ETR1).

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charges plus DUOS network infrastructure charges multiplied by a capacity/energy split adjustment factor<sup>18</sup>.

For other customers, allocated demand-related costs are calculated as above. These are then added to energy charges, as described below.

### ***Energy charges***

Energy charges for customers in categories 0-3 (larger industrial and commercial customers) are calculated as follows:

- Energy charges in each period (winter high, winter low, summer high, summer low) are calculated as the total energy-related costs to be recovered in that period from each customer category divided by forecast sales to that customer category in that period.
- The energy-related costs to be recovered in each period are calculated as total energy-related costs in the year multiplied by an allocation factor.
- The allocation factor is calculated as:
  - The product of the estimated short-run marginal cost (SRMC) in each period and energy sales in that period to the customer category.
  - The resulting product is divided by total revenues under SRMC tariffs (ie, the sum of the product of SRMC in each period multiplied by total energy sales in each period).
- Total energy-related costs are calculated as the sum of allowed market operator (MO) and system operator (SO) costs allocated to non-eligible customers and total power purchase costs less that part considered to be demand-related (see above).

For other customers, allocated demand-related costs are then added to the energy charges calculated as above. The capacity component of power purchase costs is added to energy charges applied in high periods (winter and summer). The capacity component of TUOS and DUOS charges is added to energy charges applied in all periods.

For household customers (categories 5-6), two further adjustments are made<sup>19</sup>:

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<sup>18</sup> This factor determines the proportion of demand-related distribution costs allocated to the demand charge. It is set at 100% for categories 1-2 and 0% for categories 3-4 (ie, all network-related distribution costs in these categories are allocated to energy charges).

<sup>19</sup> There is also one further adjustment to convert the resulting two-period and two-season tariffs into a one-period and two-season tariff for customers with one-rate meters.

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- In order to retain the existing ratio between high and low period charges of two to one (a decision made to increase acceptability), the high and low season charges are recalculated so that the ratio between the two periods, in each season, remains two to one.
- A three band structure is adopted. Tariffs in each band are calculated by setting the allowed energy charge in the two lower bands as a percentage of the cost-reflective energy charge (currently set at 70% for the first band and 100% for the second band). The energy charges for the third, highest, band are then recalculated so that total revenues recovered from energy charges to household customers remain unchanged.

### **Reactive power charges**

Reactive power charges, for customers in categories 1-3, are calculated as:

- The sum of allocated reactive power costs divided by total metered reactive energy (in kVARh).
- Allocated reactive power costs are calculated as reactive power costs at each voltage level (these are attributed entirely to those customers liable for reactive power charges).
- Reactive power costs at each voltage level are calculated as total voltage-related distribution costs multiplied by the assumed share of reactive power costs in these<sup>20</sup>.

A variant is also allowed, where a reactive power charge can be directly entered. This is the approach currently applied.

### **Calculation of TUOS charges**

Transmission use-of-system (TUOS) charges recover the costs of KOSTT. There are three different charges:

- Capacity (infrastructure) charge. This recovers the costs to KOSTT of operating, maintaining and investing in the transmission network. The charge is calculated as the total of KOSTT's infrastructure-related costs divided by total coincident peak demand on the transmission system, to give a charge expressed in €/kW/year. The charge is applied to suppliers only (ie, a split of G=0% / L=100%). Customers at the 110kV pay the charge applicable to both that level and the 220/400kV level. Customers at the higher voltage level pay only that charge applicable to that level.
- System operator charge. This recovers KOSTT's costs in its role as SO, including the purchase of ancillary services and losses. The charge is calculated as total SO-related costs

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<sup>20</sup> This share has been set at 6% for the 35kV network, 30% for the 10kV network and 2% for the LV network.

divided by the sum of forecast energy entering the transmission system from Kosovan sources and exiting the transmission system at all points<sup>21</sup>, to give a charge expressed in €/kWh. It is paid by both generators and suppliers.

- Market operator charge. This recovers KOSTT's costs in its role as MO. The charge is calculated as total MO-related costs divided by the sum of forecast energy entering the transmission system from Kosovan sources and exiting the transmission system at all points, to give a charge expressed in €/kWh. It is paid by both generators and suppliers.

### Calculation of DUOS charges

These comprise the following charges:

- Energy charge. This recovers KEK Distribution's costs associated with purchasing distribution losses.. It is calculated as the share of these costs allocated to each customer category divided by the forecast energy supplied to that category, to give a charge expressed in €/kWh. The allocation of costs is determined by the respective share of each customer category in energy entering the distribution system (calculated by 'grossing-up' metered consumption by losses)
- Reactive power charge. This recovers the costs to KEK Distribution of providing reactive power. It is calculated as described in Section o, above.
- Demand charge. This recovers the remaining costs of KEK Distribution. It is calculated as total long-run marginal cost (LRMC)-based revenues at each voltage level less that part recovered from reactive power charges, divided by coincident peak demand at that level, to give a charge expressed in €/kW/year. LRMC-based revenues are calculated as:
  - The estimated LRMC of distribution at each voltage level, multiplied by demand at the voltage level and further multiplied by a revenue adjustment co-efficient (to bring LRMC revenues into line with allowed revenues).
  - LRMC at each voltage level is calculated as the LRMC-coefficient at each level, grossed-up by the marginal losses incurred at each level and by the coincidence factor of demand at that level. These are summed ('cascaded') for lower voltage levels (ie, LRMC at 10kV is the sum of the adjusted LRMC-coefficient at 35kV and 10kV).
  - The LRMC-coefficient at each voltage level is calculated as the sum of the annual operating and maintenance cost and the long-run average incremental cost (LRAIC) at each voltage level.

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<sup>21</sup> This definition ensures that transit flows only pay SO charges once (on exiting the system).

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- The LRAIC at each voltage level is calculated as the present value of investments at that level divided by the incremental load served, with the result being annualized (using an assumed 20-year asset life and the weighted average cost of capital).