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ETR2 – Tariffs Calculation Guidance

10 October 2007

1 Introduction

This note summarises the general approach to calculating proposed tariffs, following estimation of allowed revenues, as part of the regulated tariffs applications to be submitted by licensees (KEK JSC and KOSTT JSC) to ERO under the second electricity tariff review (ETR2). A separate note describes the calculation of proposed allowed revenues.

2 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 €c/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 €c/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 €c/kVArh). These are used to recover the costs of providing reactive power.

3 Calculation of retail tariffs

The first electricity tariff review (ETR1) made a number of significant changes to the previous retail tariff structure:

- Standing / customer charges were introduced.
- Demand charges were removed for those customers without appropriate metering (categories 4-6). Previously, demand charges for these customers were effectively treated as an 'add-on' to the energy charge, with a consequent loss of any effective price signals.
- The balance between demand and energy charges (and, for larger customers, reactive power charges) was adjusted to better reflect the split of fixed and variable costs of supply and the recovery of customer-related costs under a new standing charge.

The general approach taken was to allocate allowed revenues into customer-related, demand-related and energy-related costs, depending on the primary cost driver. These costs were 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.

3.1 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.

3.2 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[1] in these plus TUOS network infrastructure charges plus DUOS network infrastructure charges multiplied by a capacity/energy split adjustment factor[2].

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

3.3 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.

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[1] Set at 30% by KEMA (ERO's consultants for ETR1).

[2] 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).

For household customers (categories 5-6), two further adjustments are made[3]:

- 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 (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.

3.4 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[4].

3.5 Affordability adjustments

The resulting cost-reflective charges, calculated as above, were subject to further adjustments to reconcile these with affordability concerns. These adjustments take the form of scaling factors by which the cost-reflective charges are multiplied. In determining these scaling factors, the following main principles were adopted:

- Average bills for household customers in the two lowest consumption blocks should not increase from their level under the previously existing tariffs, resulting in a downward adjustment being applied.

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[3] 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.

[4] This share has been set by KEMA at 6% for the 35kV network, 30% for the 10kV network and 2% for the LV network.

- Average bills for household customers in the third, highest, consumption block should not increase by significantly more than 10% from their level under the previously existing tariffs.

- Tariffs for other customers should be adjusted upwards to compensate for the resulting loss of revenues.

4 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 divided by the sum of forecast energy entering the transmission system from Kosovan sources and exiting the transmission system at all points[5], to give a charge expressed in €c/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 €c/kWh. It is paid by both generators and suppliers.

5 Calculation of DUOS charges

Separate DUOS charges were calculated but not applied under ETR1. 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 €c/kWh.The allocation of costs is determined by the respective share of each customer category in energy entering

[5] This definition ensures that transit flows only pay SO charges once (on exiting the system).

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 3.4, 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 €c/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.

  - 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).