



Hamdi Mramori Street, No 1  
Prishtina 10000 – Kosovo  
Tel: +381 (0) 38 247 615 ext. 103  
Fax: +381 (0) 38 247 620  
e-mail: info@ero-ks.org  
www.ero-ks.org

## **Weighted Average Cost of Capital**

### **Position Paper**

**28 July 2006**

## TABLE OF CONTENTS

|  |           |
|--|-----------|
| <b>1. Introduction .....</b>   | <b>1</b>  |
| <b>2. Assumptions.....</b>   | <b>1</b>  |
| <b>3. Calculating WACC .....</b>                                       | <b>1</b>  |
| <b>4. Estimated commercial cost of capital for KEK and KOSTT .....</b> | <b>13</b> |
| <b>5. Comparison with other estimates .....</b>                        | <b>14</b> |
| <b>6. The role of government.....</b>                                  | <b>15</b> |

### DISCLAIMER

This position paper has been prepared for ERO by a consultant team financed by the European Agency for Reconstruction. It is placed under Public Consultation and does not necessarily reflect the final view of ERO.

## **1. Introduction**

As part of the agreed split of tasks associated with the determination of allowed revenues of KOSTT and KEK under ERO's first price review, the NERA consortium is to provide proposed values for a number of assumptions to be applied in the calculation process. This note has been prepared in accordance with this agreement and sets out proposed assumptions on the weighted average cost of capital (WACC) for KEK and KOSTT.

The calculation of an appropriate WACC for a regulated company is a complex process in both theory and practice. Even where data on historic returns for stock markets and shares and on borrowing costs is available, many uncertainties remain as to the choice of model to be used, the appropriate choice of measurement methodology and period, what adjustments are required to allow for one-off circumstances and how to convert historic outcomes into forecasts for future financing costs.

For the purposes of this note, many of these methodological issues have been simplified or ignored. This is partly for reasons of practicality—time constraints mean that engaging in an extended technical debate over aspects of the calculation will risk delaying the price review as a whole. It is also a recognition that, given the huge uncertainties surrounding the estimation of the WACC for KEK and KOSTT, focusing on minor refinements to the methodology and assumptions used is unlikely to have a significant benefit in terms of improving the quality of the resulting estimates but will carry a high cost in terms of consuming regulatory, utility and consultant resources that might be better directed elsewhere.

## **2. Assumptions**

Consistent with the Tariff Methodology, this estimated WACC has been prepared under the assumption of commercial financing of KEK and KOSTT. The methodology provides for the allowed asset base on which the return is earned to be adjusted downwards where KEK or KOSTT benefits from loans at rates below commercial levels.

This calculation also assumes that there are no external constraints on KEK and KOSTT's ability to borrow, ie:

- They are not subject to, or fall within, any limits on public borrowing imposed by government in compliance with its economic strategy or IMF conditions.
- KEK and KOSTT can, if required, access foreign capital markets where available resources within Kosovo are inadequate for their needs.

## **3. Calculating WACC**

WACC, as its name suggests, is the average cost (required return) of the equity and debt financing used by a firm, weighted according to their respective shares in its capital structure according to the following formula:

$$WACC = g * r_d + (1 - g) * r_e$$

where:

$g$  gearing – the share of debt in the capital structure (expressed as  $D / (D + E)$ )

This formula is often termed the ‘vanilla’ WACC as it does not take account of the impact of taxes on required returns (see section 3.4, below, for details of how taxes are included in the estimates in this note).

The estimation of each of the components is described below.

In most cases, there is no single ‘right’ number for the various components of the estimation. We have reflected this by providing a range for many individual components and bringing these together in the final estimation to give a single estimate.

### 3.1. Gearing

The current gearing of KEK and KOSTT is effectively zero, given their reliance on donor and KCB grant funding and the lack of inherited debt carried on their balance sheet. Financial projections prepared for both KEK and KOSTT expect this situation to continue, given the expected reliance on donor funding of investments through grants for a number of years to come.

Obviously, such an assumption is inappropriate in estimating WACC on a commercial basis. Within reasonable limits, ‘gearing up’ by increasing the share of debt in the capital structure can be expected to reduce costs given the generally lower cost of debt due to its tax advantages and priority status in the event of bankruptcy. KEK and KOSTT should be expected to follow such a policy in financing new investment on a commercial basis, in order to minimise costs to their customers.

Table 1 shows the levels of gearing consistent with a target credit rating approved by regulators in a number of jurisdictions or used for ratings purposes for differing businesses within the electricity industry. In each case, only gearings consistent with an investment grade credit rating (BBB- or above) have been shown.

**Table 1: Evidence on gearing**

| <i>Country</i>  | <i>Source</i> | <i>Date</i> | <i>Business</i> | <i>AA</i> | <i>A</i> | <i>BBB</i> |
|-----------------|---------------|-------------|-----------------|-----------|----------|------------|
| Australia       | AER           | 2005        | TSO             |           | 60%      |            |
| Australia (NSW) | IPART         | 2004        | DSO             |           |          | 60%        |
| Australia (Vic) | ESC           | 2005        | DSO             |           |          | 60%        |
| Great Britain   | Ofgem         | 2000        | TSO             |           |          | 65%        |
|                 |               | 2004        | DSO             |           |          | 57.5%      |
| Ireland         | CER           | 2005        | Generation      |           |          | 55%        |
|                 |               | 2005        | TSO             |           | 50%      |            |
|                 |               | 2005        | DSO             |           | 50%      |            |
| N Ireland       | Ofreg         | 2002        | TSO/DSO         |           |          | 50%        |
| USA             | Fitch         | 2001(?)     | DSO             | 50%       | 55%      | 60%        |

| <i>Country</i> | <i>Source</i>   | <i>Date</i> | <i>Business</i> | <i>AA</i> | <i>A</i> | <i>BBB</i> |
|----------------|-----------------|-------------|-----------------|-----------|----------|------------|
|                | (target)        |             | DSO + Supply    | 45%       | 48%      | 55%        |
|                | S&P<br>(actual) | 2002(?)     | All             | 47%       | 54%      | 58%        |

Sources: ECA research

Based on the above, it seems reasonable to **assume that KEK’s DSO business and KOSTT, should aim for a gearing of around 60% on average for commercially financed investments**, and this should be used in the estimation of a commercial WACC for these businesses.

There is some evidence that generation and supply might be considered more risky than TSO and DSO businesses given that they operate in competitive markets, and therefore a lower gearing should be applied. It can also be argued, for generation in particular, that a higher gearing of 65-70%, consistent with the levels seen in project financing, should be assumed given the most new investments are expected to be financed in this manner.

At present, there appears little risk of KEK Generation and KEK Supply losing their effective monopolies for a number of years, given the very small number of potentially eligible customers and alternative suppliers. It is not clear how KEK Generation investments in rehabilitating existing units, sales from which are regulated, will be financed, but these may not be attractive to private investors given their regulated status. New generation investments will be undertaken by private investors and will be unregulated. **There seems little reason to apply a different assumption on gearing for KEK Generation and KEK Supply** as is applied to KEK DSO and KOSTT.

### 3.2. Return on debt

The return on debt can be considered to comprise two elements:

- the required return on a riskless asset (the risk-free rate); and
- the additional return required to compensate a lender for the risks associated with an individual borrower (the debt risk premium, DRP).

This can be written as the following formula:

$$r_d = r_f + p_d$$

where:

$r_f$  risk-free rate

$p_d$  debt risk premium associated with individual borrower

#### **Risk-free rate**

There is no true equivalent to a riskless asset—all investments carry some risk, however small. Government bonds are usually used as a proxy—as the lowest risk investment possible. In principle, bonds used for this purpose in utility regulation should be freely traded in liquid markets, with a term matching the expected life of

the infrastructure assets to be financed by regulated firms<sup>1</sup>. In practice, it is difficult in most cases to find bonds with all these characteristics.

As the Kosovan government does not issue bonds, it is necessary to use a proxy for the sort of yields that might be required if it were to do so. This can be done by reviewing the yields on bonds issued by governments with a similar credit rating to that which might apply to Kosovo. Even if final status is rapidly resolved, political and economic risk is likely to remain high while the ability of the Government to continue to raise sufficient revenues to meet increasing expenditure needs as donor assistance further reduces must be unclear. It therefore seems appropriate to assume that, at least initially, Kosovo would attract a credit rating below investment grade.

Table 2 shows the yield (nominal and real) for a number of bonds issued by governments with below-investment grade credit ratings.

**Table 2: Emerging market government bonds**

| <i>Country</i>                           | <i>Redemption Date</i> | <i>Rating (Standard &amp; Poors)</i> | <i>Nominal Yield</i> | <i>Forecast Inflation</i> | <i>Real Yield<sup>a</sup></i> |
|--|------------------------|--------------------------------------|----------------------|---------------------------|-------------------------------|
| <b>US\$-denominated</b>                  |                        |                                      |                      |                           |                               |
| Ukraine                                  | Jun 2013               | BB-                                  | 7.12%                | 2.4%                      | 4.6%                          |
| Brazil                                   | Mar 2015               | BB                                   | 7.38%                | 2.4%                      | 4.9%                          |
| Turkey                                   | Mar 2015               | BB-                                  | 7.33%                | 2.4%                      | 4.8%                          |
| Peru                                     | May 2016               | BB                                   | 7.16%                | 2.4%                      | 4.6%                          |
| Philippines                              | Jan 2019               | BB-                                  | 7.67%                | 2.4%                      | 5.1%                          |
| Colombia                                 | Feb 2020               | BB                                   | 7.87%                | 2.4%                      | 5.3%                          |
| Venezuela                                | Sep 2027               | BB-                                  | 7.46%                | 2.4%                      | 4.9%                          |
| Ecuador                                  | Aug 2030               | CCC+                                 | 10.26%               | 2.4%                      | 7.7%                          |
| Argentina                                | Dec 2033               | B                                    | 8.95%                | 2.4%                      | 6.4%                          |
| <b>€-denominated</b>                     |                        |                                      |                      |                           |                               |
| Brazil                                   | Feb 2010               | BB                                   | 4.69%                | 2.0%                      | 2.6%                          |
| Turkey                                   | Feb 2017               | BB-                                  | 5.87%                | 2.0%                      | 3.8%                          |
| <b>Range (all countries)</b>             |                        |                                      |                      |                           | <b>2.6-7.7%</b>               |
| <b>Average (all countries)</b>           |                        |                                      |                      |                           | <b>5.0%</b>                   |
| <b>Average (Ukraine and Turkey only)</b> |                        |                                      |                      |                           | <b>4.4%</b>                   |

Source: *Financial Times* (22 May 2006). Only bonds with a credit rating of below investment grade are shown. US and Eurozone inflation are forecast change in CPI for 2007 as reported in the *Economist* (20 May 2006).

<sup>a</sup>  $(1 + \text{nominal yield}) / (1 + \text{forecast inflation})$

It seems reasonable to expect that Kosovo would be rated somewhat below the Ukraine and Turkey, which both have a credit rating of BB- (the next rating down in

<sup>1</sup> An alternative argument is that the term of the bonds should match the price control period, as investors may be unwilling to lend for longer periods given the need to review and revise

the table is that of Argentina, at B). At the same time, it is apparent that yields on Ukrainian and Turkish debt are slightly below those of Latin American governments with the same or higher credit ratings, possibly suggesting that European borrowers are seen as slightly more attractive risks. It therefore seems reasonable to **assume a real risk-free rate of 5.5% for Kosovo**, which lies between the average yield for the Ukraine and Turkey and that of Argentina.

### ***Debt risk premium***

Ideally, it would be possible to use the actual cost of borrowing of a firm to determine its cost of debt financing. However, this generally requires the firm to have issued long-term bonds. Short-term commercial bank loans are of only limited use as a guide to the costs of raising finance over the terms typically required for infrastructure investments. As with other elements of the WACC estimation, therefore, we have used proxies for the cost of borrowing by KEK and KOSTT.

A July 2005 IMF report estimated the average nominal interest rate for Kosovo for loans exceeding one year as being around 14.3%<sup>2</sup> in April 2003, equivalent to a real interest rate of approximately 13.3% and a debt risk premium, assuming an unchanged risk-free rate from 2006 levels, of around 8%.

It would seem reasonable to expect that KEK and KOSTT should be able to borrow at lower risk premia than this level, particularly as their commercial performance improves, and that borrowing costs overall in Kosovo should fall over time as the market matures and lenders and borrowers become more familiar with and better able to manage credit risks. KEK and KOSTT should also be of a sufficient scale to be able to investigate opportunities to borrow from foreign sources where alternative lending opportunities are significantly lower cost.

The sample of EU and Australian regulators included in Table 1, used debt risk premia of 0.84-1.75% in their recent decisions. The appropriate debt risk premia for KEK and KOSTT would appear to be somewhere above this range—given the high risks of non-payment associated with KEK's traditionally poor commercial performance. However, ERO is also committed, we believe, to ensuring that KEK, provided it achieves reasonable commercial targets, is able to finance its activities allowing for losses and non-payment problems, including debt service and risks to lenders should therefore fall from historic levels. **A debt risk premium of 2.0-2.5% might therefore be appropriate**<sup>3</sup>. The same premium should apply to both KEK and KOSTT, given that KOSTT's own income is to a large extent dependent on KEK's performance.

### ***Estimated return on debt***

The resulting **estimated real return on debt for KEK and KOSTT is 7.5-8.0%**, calculated as below:

---

<sup>2</sup> International Monetary Fund (July 2005), *Kosovo: Gearing Policies Towards Growth and Development*, Staff Paper (available from: <http://www.imf.org/external/pubs/ft/kosovo/2005/gpgd.pdf>).

<sup>3</sup> This assumes no benefit from government guarantees (explicit or implicit). In general, the government should avoid entering into contingent liabilities associated with such guarantees or, where these are provided, should charge an appropriate fee for the resulting insurance benefits. By doing so, increased transparency and efficiency in financing will result and government fiscal resources are freed for social purposes.

$$\begin{aligned} \text{Min} \quad r_d &= 5.5\% + 2.0\% = 7.5\% \\ \text{Max} \quad r_d &= 5.5\% + 2.5\% = 8.0\% \end{aligned}$$

### 3.3. Return on equity

Three main models exist to estimate the required return on equity:

- The dividend growth model (DGM) expresses the return as the sum of the expected dividend yield plus the expected rate of growth in dividends. Its application is problematic as, in essence, the choice of growth rate, for which there is little external evidence, drives the expected return on equity.
- The capital asset pricing model (CAPM) relates the required return on a share to its relative volatility (non-diversifiable risk) compared to the stock (asset) market as a whole. A share that is more volatile than the market will be expected to have a higher return. The relative volatility can be empirically estimated as the covariance of share movements and those of the stock market. The CAPM has a solid grounding in economic and corporate finance theory but has proved unable to explain a number of real-life market phenomena in practice.
- The asset pricing model (APM) extends the CAPM by incorporating additional explanatory factors related to observed outcomes, such as the higher returns in reality on shares of small firms than would be expected under the CAPM. However, it lacks a strong theoretical basis and has a high risk of ‘data mining’<sup>4</sup>. As with the CAPM, there is also uncertainty whether relationships that held in the past will continue to apply in the future or in other countries.

Outside the USA, the CAPM appears to be the most widely-used model to estimate the cost of equity. As none of the other models is demonstrably superior while lacking both the theoretical basis and common usage of the CAPM, we apply the CAPM in this note.

The formula underlying the CAPM is:

$$r_e = r_f + \beta * (r_m - r_f)$$

where

$\beta$  equity beta - covariance of return on stock market and return on individual share ( $\beta = 1$  means the stock market and share have the same volatility and therefore non-diversifiable risk)  
 $r_m$  return on the stock market as a whole  
 $r_m - r_f$  equity risk premium

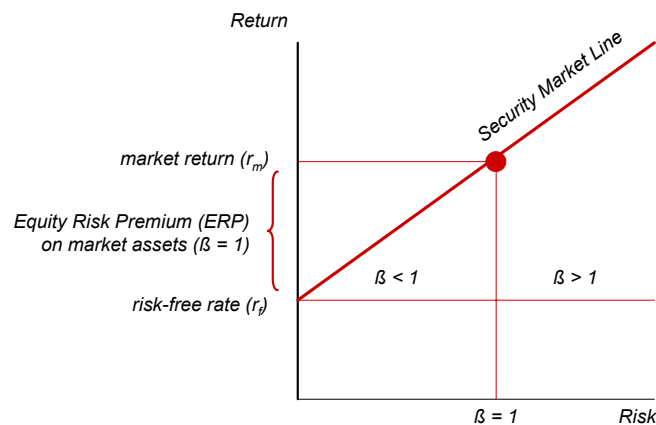
Figure 1 illustrates this concept.

---

<sup>4</sup> Where a relationship is determined by comparing historic data without necessarily having any underlying justification, rather than trying to first determine an explanatory relationship and then testing it using the data. The former approach is of little use in trying to forecast future outcomes.



**Figure 1: CAPM illustrated**



### ***Equity risk premium***

The equity risk premium (ERP) represents the additional risk involved in holding equity (shares), rather than a riskless asset. It is usually proxied by the difference between returns on government bonds and a stock market index.

Clearly, in the absence of a stock market in Kosovo, any estimation of the ERP (and other components of the CAPM) model, needs to draw on international proxies. Fortunately, there are a large number of studies estimating the ERP for a variety of countries.

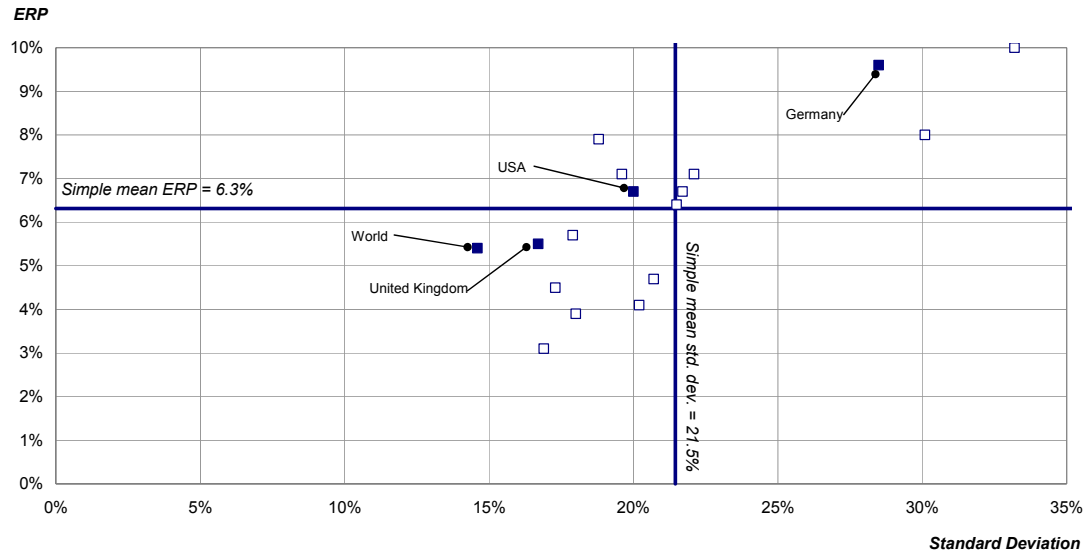
There continues to be widespread debate as to:

- Should a world or country-specific index be used and should the ERP vary between countries?
- Is there a ‘survivorship bias’ (more successful and larger markets are associated with historically higher returns, but may have less risk than smaller and less successful markets)?
- What is the appropriate time period to measure the ERP over?
- Have there been fundamental changes in the relative riskiness and costs of stock markets due to changing market structures and falling transactions costs over time?
- Are historic differences in returns a true measure of expected differences (which is what the ERP is intended to reflect)?
- Should stock market returns be measured relative to bonds or bills?
- Should a geometric or arithmetic mean be used?

We do not discuss the details of these various debates in this note, but can provide further information and sources on request. Our estimate of the ERP uses published estimates of the arithmetic mean of the ERP relative to government bonds over the period 1900-2000. The use of a longer time period makes the results more robust, the use of bonds means that the assumed risk-free asset has a life closer to those of infrastructure investments and the use of the arithmetic mean follows convention.

Figure 2 shows the ERP estimated for a range of world stock markets calculated on this basis.

**Figure 2: ERP estimates, 1900-2000**



Source: Dimson, Marsh & Staunton (2002), *Triumph of the Optimists*, Princeton University Press

The mean<sup>5</sup> ERP for the markets studied is 6.3% with a median ERP of 6.6%.

Recent regulatory decisions, as illustrated in Table 3, below, range from 3.5-7.0%, with a mean<sup>6</sup> of 5.20% and median of 5.0%. This suggests that regulators have settled on a lower ERP than historic levels. In general, EU regulators appear to have adopted lower values than regulators in Australia and New Zealand. This may suggest EU regulators believe that the ERP in the EU is below world averages.

<sup>5</sup> Excluding the world stock market, which is a composite of the individual country stock markets.

<sup>6</sup> Multiple decisions by the same regulator in the same year are treated as a single decision for the purposes of calculating averages.

**Table 3: International regulatory decisions on ERP (post-2000)**

| Country     | Regulator           | Industry               | Range of ERP Estimates |       | Most Recent Decision |                  |
|-------------|---------------------|------------------------|------------------------|-------|----------------------|------------------|
|             |                     |                        | Min                    | Max   | Date                 | ERP <sup>a</sup> |
| Australia   | ACCC                | Electricity TSO        | 6.0%                   | 6.0%  | 2005                 | 6.0%             |
|             | ESC                 | Electricity DSO        | 6.0%                   | 6.0%  | 2005                 | 6.0%             |
| Belgium     | CREG                | Gas DSO                | 3.5%                   | 3.5%  | 2006                 | 3.5%             |
| Finland     | Ficora              | Mobile telecoms        | 4.0%                   | 6.0%  | 2005                 | 5.0%             |
|             | EMA                 | Gas TSO                | 5.0%                   | 5.0%  | 2004 <sup>b</sup>    | 5.0%             |
|             |                     | Electricity TSO        | 5.0%                   | 5.0%  | 2004 <sup>b</sup>    | 5.0%             |
| Ireland     | CER                 | Electricity Generation | 5.25%                  | 5.25% | 2005                 | 5.25%            |
|             |                     | Electricity TSO / DSO  | 5.25%                  | 5.25% | 2005                 | 5.25%            |
| Netherlands | Dte                 | Electricity TSO        | 4.0%                   | 6.0%  | 2005                 | 5.0%             |
|             |                     | Electricity DSO        | 4.0%                   | 7.0%  | 2005                 | 5.0%             |
|             |                     | Gas DSO                | 4.0%                   | 6.0%  | 2005                 | 5.0%             |
|             | Opta                | Post                   | 6.0%                   | 6.0%  | 2002                 | 6.0%             |
| New Zealand | Commerce Commission | Gas DSO                | 7.0%                   | 7.0%  | 2004                 | 7.0%             |
|             |                     | Electricity DSO        | 7.0%                   | 7.0%  | 2005                 | 7.0%             |
| UK          | Ofgem               | Electricity DSO        | 3.25%                  | 4.8%  | 2004                 | 4.8%             |
|             | Ofwat               | Water                  | 3.0%                   | 4.0%  | 2004                 | 4.5%             |
|             | Ofcom               | Telecoms wires         | 4.5%                   | 4.5%  | 2005                 | 4.5%             |
|             |                     | Telecoms retail        | 4.5%                   | 4.5%  | 2005                 | 4.5%             |
|             | Postcomm            | Post                   | 4.0%                   | 5.0%  | 2005                 | 4.5%             |
|             | CAA                 | Airports               | 3.5%                   | 4.5%  | 2005                 | 4.0%             |

Source: PricewaterhouseCoopers (May 2006), *TenneT TSO: Comparison study of the WACC*, Final Report (downloadable from [http://www.dte.nl/images/Comparison%20study%20of%20the%20WACC-%20Mei%202006\\_tcm7-87013.pdf](http://www.dte.nl/images/Comparison%20study%20of%20the%20WACC-%20Mei%202006_tcm7-87013.pdf)) and ECA research

<sup>a</sup> Where a range is given, the mid-point is used unless the regulator has stated otherwise

<sup>b</sup> Information from working document. Final decision may differ from this value

We use an **assumed ERP of 5.0-6.0% in the estimation of WACC, in the range supported by recent regulatory decisions**, although approximately 0.5-1.0% lower than suggested by historical evidence.

### **Beta**

In estimating an appropriate beta, we have relied largely on recent regulatory decisions, as shown in Table 4. It is clearly not possible to estimate betas directly for KEK and KOSTT while the use of calculated historic betas for comparators is

difficult without access to the necessary databases and because of the uncertainties caused by the Technology, Media, Telecommunications (TMT) ‘bubble’ in stockmarkets<sup>7</sup> around the turn of the century.

**Table 4: International regulatory decisions on equity betas (post-2000)**

| <i>Country</i> | <i>Regulator</i>    | <i>Industry</i>        | <i>Range of Beta Estimates</i> |            | <i>Most Recent Decision</i> |                         |
|----------------|---------------------|------------------------|--------------------------------|------------|-----------------------------|-------------------------|
|                |                     |                        | <i>Min</i>                     | <i>Max</i> | <i>Date</i>                 | <i>Beta<sup>a</sup></i> |
| Australia      | ACCC                | Electricity TSO        | 1.00                           | 1.00       | 2005                        | 1.00                    |
|                | ESC                 | Electricity DSO        | 1.00                           | 1.00       | 2005                        | 1.00                    |
| Belgium        | CREG                | Gas DSO                | 1.00                           | 1.00       | 2006                        | 1.00                    |
| Finland        | Ficora              | Mobile telecoms        | 1.40                           | 1.43       | 2005                        | 1.415                   |
|                | EMA                 | Gas TSO                | 0.35                           | 0.35       | 2004 <sup>b</sup>           | 0.35                    |
|                |                     | Electricity TSO        | 0.44                           | 0.44       | 2004 <sup>b</sup>           | 0.44                    |
| Ireland        | CER                 | Electricity Generation | 1.00                           | 1.50       | 2005                        | 1.22                    |
|                |                     | Electricity TSO / DSO  | 0.60                           | 1.00       | 2005                        | 0.80                    |
| Netherlands    | Dte                 | Electricity TSO        | 0.27                           | 0.58       | 2005                        | 0.58                    |
|                |                     | Electricity DSO        | 0.45                           | 0.85       | 2005                        | 0.605                   |
|                |                     | Gas DSO                | 0.43                           | 0.59       | 2005                        | 0.51                    |
|                | Opta                | Post                   | 0.76                           | 0.76       | 2002                        | 0.76                    |
| New Zealand    | Commerce Commission | Gas DSO                | 0.60                           | 0.60       | 2004                        | 0.60                    |
|                |                     | Electricity DSO        | 0.58                           | 0.58       | 2005                        | 0.58                    |
| UK             | Ofgem               | Electricity DSO        | 1.00                           | 1.00       | 2004                        | 1.00                    |
|                | Ofwat               | Water                  | 0.70                           | 1.00       | 2004                        | 1.00                    |
|                | Ofcom               | Telecoms – wires       | 0.80                           | 0.90       | 2005                        | 0.85                    |
|                |                     | Telecoms – retail      | 1.10                           | 1.20       | 2005                        | 1.15                    |
|                | Postcomm            | Post                   | 0.81                           | 0.94       | 2005                        | 0.875                   |
|                | CAA                 | Airports               | 0.80                           | 0.80       | 2005                        | 0.80                    |

Source: PricewaterhouseCoopers (May 2006), *TenneT TSO: Comparison study of the WACC*, Final Report (downloadable from [http://www.dte.nl/images/Comparison%20study%20of%20the%20WACC-%20Mei%202006\\_tcm7-87013.pdf](http://www.dte.nl/images/Comparison%20study%20of%20the%20WACC-%20Mei%202006_tcm7-87013.pdf)) and ECA research

- a* Where a range is given, the mid-point is used unless the regulator has stated otherwise  
*b* Information from working document. Final decision may differ from this value

<sup>7</sup> There is extensive evidence that betas for utilities fell to very low levels during this period. Historic estimates including data for 1998-2001 are therefore likely to be unreliable as a guide to future equity betas. More recent data can be used, but this creates problems of unreliable results where the available data series are short (using monthly data would only allow a maximum of around 50 data points).

There appears to be evidence that those businesses operating in more competitive markets are considered to have a higher equity beta, as shown in Table 5.

**Table 5: Average equity beta decisions**

|        | <i>All Businesses</i> | <i>Competitive Businesses<sup>a</sup></i> | <i>Monopoly Businesses</i> |
|--------|-----------------------|---|----------------------------|
| Mean   | 0.827                 | 1.262                                     | 0.75                       |
| Median | 0.80                  | 1.22                                      | 0.80                       |

*a* Ficora (mobile telecoms), CER (electricity generation) and Ofcom (telecoms – retail) from Table 4. All other businesses are assumed to be monopoly businesses.

This assumption is supported by evidence used by the Irish electricity regulator (the Commission for Energy Regulation) that the average asset beta<sup>8</sup> for EU network and integrated utilities is 0.42 compared to 0.54-0.63 for stand-alone generation and supply utilities in the EU and USA.

As we have discussed in Section 3.1, at this stage, it seems appropriate to assume that KEK Generation and KEK Supply operate in largely monopoly markets. It therefore appears reasonable to apply a common equity beta assumption to all of KEK’s businesses and KOSTT.

Given the small size of the Kosovan electricity industry, it seems reasonable to assume that demand growth (which is the main driver of revenue growth) will be more volatile relative to GDP growth (which is the main driver of stock market growth) than in more developed and larger countries. The addition of a single major customer will mean a large increase in electricity demand relative to previous levels, while the impact on GDP may be much less<sup>9</sup>. In larger economies, a single new large customer is likely to mean only a small change in total electricity demand.

We therefore **assume a common equity beta of 0.80-1.00 for KEK and KOSTT**, above the average of EU regulatory decisions, to take account of the potentially more volatile nature of KEK’s (and KOSTT’s) revenues relative to GDP growth.

***Estimated post-tax return on equity***

The resulting **estimated range for the real post-tax return on equity required by KEK and KOSTT is 9.5-11.5%**, calculated as below:

$$\begin{aligned} \text{Min} \quad r_e &= 5.5\% + 0.80 * 5.0\% = 9.5\% \\ \text{Max} \quad r_e &= 5.5\% + 1.00 * 6.0\% = 11.5\% \end{aligned}$$

<sup>8</sup> The asset beta is the average of the equity and debt betas, weighted according to gearing. It is common (although debateable) practice to assume that the debt is zero for the purposes of converting to and from equity betas.

<sup>9</sup> For example, the connection of Feronikeli is projected to lead to an increase in electricity sales by 2008 of 14% above levels without Feronikeli. The impact of Feronikeli on GDP is unknown, but it would need to deliver an annual GDP increase of €300-350 million to have a similar impact.

### 3.4. Taxes

Taxes are a cost of doing business. A regulated company should be allowed to recover these taxes, either by:

- including an allowance for taxes in the costs recovered from regulated tariffs; or
- adjusting the cost of equity upwards to compensate for the need to earn a return high enough to cover taxes and still meet the requirements of shareholders.

This estimate adopts the latter approach. It has the advantage of removing the need for ERO to seek to determine the tax liabilities of KEK and KOSTT. The disadvantage is that it creates incentives for KEK and KOSTT to minimise their tax liabilities and retain the resulting savings as additional profit, which may appear somewhat perverse given their status as state-owned entities.

The adjustment is made by multiplying the post-tax cost of equity by a ‘tax wedge’, as follows:

$$\text{tax wedge} = 1 / (1 - t_c)$$

where

$t_c$  tax rate on corporate profits

The profit tax rate in Kosovo is 20%, making the tax wedge:

$$1 / (1 - 0.20) = 1.25$$

#### ***Estimated pre-tax return on equity***

The estimated real pre-tax return on equity for KEK and KOSTT is 11.9-14.4%, calculated as below:

$$\begin{aligned} \text{Min } r_{ep} &= 9.5\% * 1.25 = 11.9\% \\ \text{Max } r_{ep} &= 11.5\% * 1.25 = 14.4\% \end{aligned}$$

### 3.5. ‘Small company’ adjustment

In some cases, regulators have made upward adjustments to the estimated cost of equity and/or debt for smaller and non-traded companies. These adjustments reflect the relatively higher transactions costs in issuing and trading debt and equity for these firms<sup>10</sup>.

Examples of these adjustments are shown in Table 6, below.

**Table 6: Small company adjustments**

| <i>Country</i> | <i>Regulator</i> | <i>Date</i> | <i>Adjustment</i> |  |
|----------------|------------------|-------------|-------------------|--|
|----------------|------------------|-------------|-------------------|--|

<sup>10</sup> There is an argument that this implies consumers are required to pay the costs of a decision by utilities to remain inefficiently small. However, this argument does not apply to KEK, which cannot further expand within Kosovo.

|         |                   |      | <i>Debt</i>                              | <i>Equity</i>                       |
|---------|-------------------|------|--|-------------------------------------|
| Belgium | CREG              | 2004 | n/a                                      | +20% to cost of equity <sup>a</sup> |
| UK      | Ofwat             | 2004 | (4 bands according to RAB <sup>b</sup> ) |                                     |
|         | <€102 million     |      | +0.5%                                    | +1.5% post-tax                      |
|         | €102<€203 million |      | +0.4%                                    | +1.3% post-tax                      |
|         | €203<€406 million |      | +0.3%                                    | +1.2% post-tax                      |
|         | €406<1015 million |      | +0.1%                                    | +0.5% post-tax                      |

Source: PricewaterhouseCoopers (May 2006), *TenneT TSO: Comparison study of the WACC*, Final Report (downloadable from [http://www.dte.nl/images/Comparison%20study%20of%20the%20WACC-%20Mei%202006\\_tcm7-87013.pdf](http://www.dte.nl/images/Comparison%20study%20of%20the%20WACC-%20Mei%202006_tcm7-87013.pdf)) and ECA research

*a* It is not clear whether this increase refers to percentage points or a multiplicative factor  
*b* Ofwat groups small companies into bands using their regulated asset base

By the standards of EU comparators, KEK and KOSTT fall into the small company category, particularly if KEK's businesses are treated as independent entities<sup>11</sup>. Any potential increases in financing costs that this might cause are likely to be exacerbated by the general lack of familiarity with Kosovo among potential investors and lenders.

It therefore seems reasonable to allow a small company premium for both KEK and KOSTT. The most detailed study of this effect has been undertaken by Ofwat. It is difficult to determine which category KEK and KOSTT would fall into. Using KEK's 2004 asset value, KEK as a whole would fall into the third of the bands applied by Ofwat (€203<€406 million). It seems reasonable to assume, as separate companies, the KEK and KOSTT might fall into the second band (€102<€203 million). Allocating them to this band is also a conservative assumption, reflecting any additional premium required to compensate investors for the transactions costs associated with financing in Kosovo.

We therefore assume a **small company premium of +0.4% on the cost of debt and +1.3% on the post-tax cost of equity for both KEK and KOSTT.**

#### 4. Estimated commercial cost of capital for KEK and KOSTT

Table 7 sets out our estimate of the commercial cost of capital for KEK and KOSTT, using the various individual component estimates derived as described above.

**Table 7: Estimated commercial WACC for KEK and KOSTT**

| <i>Component</i>    |       | <i>Min</i> | <i>Max</i> |
|---------------------|-------|------------|------------|
| Real risk-free rate | $r_f$ | 5.5%       | 5.5%       |
| Debt risk premium   | $p_d$ | 2.0%       | 2.5%       |

<sup>11</sup> KEK's balance sheet, as at 31 December 2004, reported €350 million in fixed assets. Although no breakdown between businesses is given, it seems reasonable to assume that no individual business (mining, generation, transmission, distribution and supply) would have assets significantly in excess of €100 million.

|                              |  |               |        |
|------------------------------|--|---------------|--------|
| Small company debt premium   | $s_d$  | 0.4%          | 0.4%   |
| Cost of debt                 | $r_d = r_f + p_d + s_d$                                    | 7.9%          | 8.4%   |
| Gearing                      | $g$  | 60%           | 60%    |
| Equity risk premium          | $r_m - r_f$  | 5.0%          | 6.0%   |
| Equity beta                  | $\beta$  | 0.80          | 1.00   |
| Small company equity premium | $s_e$  | 1.3%          | 1.3%   |
| Cost of equity               | $r_e = r_f + \beta * (r_m - r_f) + s_e$                    | 10.8%         | 12.8%  |
| <b>Vanilla real WACC</b>     | $WACC_{post-tax} = g * r_d + (1 - g) * r_e$                | 9.06%         | 10.16% |
|                              | <b>Mid-point</b>   | <b>9.61%</b>  |        |
| Tax wedge                    | $1 / (1 - t_c)$  | 1.25          | 1.25   |
| Pre-tax cost of equity       | $r_{e\ pre-tax} = 1 / (1 - t_c) * r_e$                     | 13.50%        | 16.00% |
| <b>Pre-tax real WACC</b>     | $WACC_{pre-tax} = g * r_d + (1 - g) * 1 / (1 - t_c) * r_e$ | 10.14%        | 11.44% |
|                              | <b>Mid-point</b>   | <b>10.79%</b> |        |

The **final estimate for the real pre-tax WACC for both KEK and KOSTT is 10.8%** (rounding to one decimal place)

## 5. Comparison with other estimates

As a check on this estimate, we have compared it with available comparator estimates of the cost of capital for Kosovo. These are presented in Table 8, below.

**Table 8: Alternative estimates of the cost of capital in Kosovo**

| <i>Source</i>               |                                  | <i>Date</i>                  | <i>Estimate</i>   | <i>Calculation details</i> |
|-----------------------------|----------------------------------|------------------------------|---|----------------------------|
| KEK                         | Financial Recovery Plan          | Feb 2005                     | 6% nominal pre-tax  | none given                 |
| Vattenfall Europe Mining AG | Mid-Term Mining Plan             | Mar 2005                     | 12% real pre-tax  | target IRR                 |
| Steag consortium            | Mining Plan for Sibovc SW Mine   | Apr 2006                     | 10.2-11.6% nominal pre-tax <ul style="list-style-type: none"> <li>• cost of debt 6-8%</li> <li>• cost of equity 20%</li> <li>• gearing 70%</li> </ul> | none given                 |
| IMF                         | <i>Gearing for Growth</i> report | Jul 2005 (data for Dec 2003) | return on equity – banks<br>18.7% nominal   | none given                 |



As can be seen, in most cases it is difficult to identify the underlying assumptions used to derive the cost of capital. It is clear that our estimate of a commercial WACC for KEK and KOSTT falls within the ranges of other estimates. If anything, our estimate appears conservative if compared with the return on equity earned by banks.

## **6. The role of government**

The preceding estimate, as discussed in Section 2, is based on the assumption of a commercial WACC. In practice, the government may wish to accept a lower return on equity than a private investor would require, enabling the allowed return to be reduced (independently of whether donor financing also allows reductions). For example, if the government did not require any return on its shareholding in KEK, then this would reduce the estimated WACC from 10.8% to 4.9%.

However, before any decision to adopt such a policy, it is important to consider its potential costs. In particular:

- Requiring a firm to target a market return on equity creates appropriate incentives on its management to operate in a commercial fashion. Without this, there is a high risk that social and political concerns will override commercial considerations to the detriment of the operating and investment efficiency of the firm and its longer-term viability.
- Where publicly-owned firms are competing against private firms (as might be the case for KEK Supply, for instance), setting a target return below market levels will give a significant advantage (in effect, a subsidy) to the public firm.
- Accepting a return on the government's shareholdings in electricity businesses below commercial levels essentially benefits consumers at the expense of taxpayers—who must pay more to make up for the resulting loss of government revenues.
- If government wishes to subsidise particular uneconomic activities, such as electricity supply to remote areas or poorer households, then it should do so through a separate and transparent subsidy mechanism linked to a defined PSO, rather than through general reductions in tariffs below commercial levels. This is both more economically efficient and compliant with EU directives.