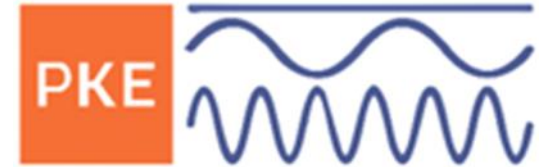


Estimating fair rate of return in times of high inflation

Roundtable input by North Macedonia
Energy and Water Services Regulatory Commission



WACC calculation model



The weighted average cost of capital on real basis before taxation (WACC) for the regulated company is calculated according to the following formula:

$$\mathbf{WACC = \{((1 - Debt) * Ke) / (1 - Tp)\} + Debt * Kd}$$

where:

Debt - long-term debt 40% of the total capital (60% own capital, or equity + 40% long-term debt)

Ke - cost of equity (own capital)

Kd - cost of debt

Tp - revenue tax rate

WACC specification



Cost of equity (own capital) (K_e), is calculated with the application of the CAPM - Capital Asset Pricing Model, based on the revenue of non-risk investments, risk premium and systematic risks expressed with the coefficient β , according to the following formula:

$$K_e = R_f + MRP \cdot \beta$$

where:

R_f - rate of return without risk, which is calculated as equal to the bond yield issued by the Government of the Republic of North Macedonia

β - beta on equity (market portfolio) is determined as equal to 1 (one)

$MRP = (R_m - R_f)$ - equity risk premium is calculated as a difference between „average revenue of risk investments (R_m) and revenue of non-risk investments (R_f)“;

R_m - average revenue of risk investments is calculated as average interest rate of long-term loans (in euro, USA dollars and denars) approved to the companies in the Republic of Macedonia, and published by the National Bank of the Republic of North Macedonia

WACC specification



Cost of debt (Kd) of the regulated company is calculated according to the average interest rate of the used investment loans by the regulated company to perform the regulated activity, and the control is carried out based on long terms loans conditions and interest rates, published by the National Bank of the Republic of North Macedonia.

Rate of return on equity before taxes

Decision for TSO
(December 2022)

Equity = 98,83%

Long term debt = 1,17%

Kd – real cost of debt = 0%

Debt premiums = 5,48%

Risk free rates = 1,68%

Market risk premiums = 3,80%

$\beta = 1$

Cost of equity = 5,48%

Tp - Profit tax rate = 10%

WACC = 6,0176%

WACC adjustments



- From the very beginning until today, ERC has been applying the revenue cap method for determining the regulated maximum revenue of TSO and DSO, except for the first regulated period when a price cap method was applied when determining the TSO tariff.
- The revenue caps for TSO and DSOs are set for a five-years regulatory period (current regulatory period 2022-2026).
- ERC no later than December 31 in the first year of the regulated period, sets the base revenue for all five years of the regulated period and the maximum revenue for the first year of the regulated period. In the second, third, fourth and fifth year of the regulated period, ERC sets the maximum revenue for the current year by December 31 at the latest.
- The data from the base year are used in the calculation of the components contained in the base revenue. The revenue caps consist of the following main components: basic revenue, specified pass-through costs and losses. The basic revenue which consists of operational cost, depreciation, return on assets is set at the beginning of the regulatory period for each year and is not adjusted during the regulatory period.
- WACC is determined for the 5 year regulatory period in advance for each year and is not adjusted during the regulatory period.

Inflation effect on WACC and/or tariffs



- The influence of inflation is reflected in the determination of the base revenue for each (t) year (BR_t) of the regulated period, and is calculated according to the following formula:

$$BR_t = [O_{t-1} \cdot (1 + CPI_t) + Dt + RAt] \cdot (1 - SX)$$

where:

BR_t - base revenue for the t year

CPI_t - consumer price index for the base year, published by the State Statistical Office

O_{t-1} - normalised operating costs for the previous year

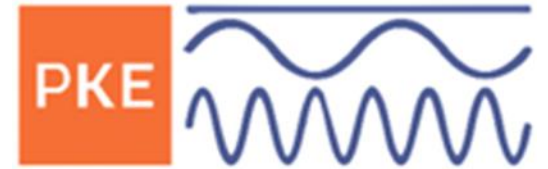
Dt - depreciation for the current year

RAt - return of regulated assets in the t year

SX - regulated revenue settlement factor

- According to the methodology used by ERC, until now, during the control of the basic revenue, no changes were made as a result of changes in inflation.
- The basic revenue is set at the beginning of the regulatory period for each year and is not adjusted during the regulatory period.

Methodology adjustments



- Currently ERC working on amendments of the existing Rulebook on determining the regulated maximum revenue and regulated average tariffs for natural gas transmission, organization and management of the natural gas market and distribution of natural gas, in which will be incorporates a new chapter "CONSTRUCTION OF A NEW SYSTEM FOR DISTRIBUTION OF NATURAL GAS IN THE TERRITORY OF THE REPUBLIC OF NORTH MACEDONIA"
- In accordance with the provisions of the draft version of the Rulebook:
 - The operator of the natural gas distribution system on the territory of the Republic of North Macedonia (the new distributor) who will finance the design, construction, management, maintenance and development of the natural gas distribution system in the Republic of North Macedonia, is approves the regulated maximum tariff determined based on the data from the investment project and the submitted data with the request for determining the tariff for natural gas distribution
 - The regulated maximum tariff shall be determined based on the methodology of adjusting the changes of the costs of the new distributor within the regulated period, which provides sufficient income to cover the justified costs and realization of adequate return on equity.
 - The regulated period for a new distribution system operator is eight years.
- ERC is currently doing detailed analysis of the elements that enter the calculation of the value of WACC, which is also planned to be subject to amendment of the existing Rulebook .



**THANK YOU
FOR YOUR ATTENTION!**

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