

# RECOMMENDED PRINCIPLES FOR CALCULATING THE PRICE FOR WATER SERVICE

## 1. Objective and Scope

This methodology “Recommended principles for calculating the price for water service” has been prepared by the Competition Authority (hereinafter referred to as the CA) on the basis of § 14 (9) of the version of the Public Water Supply and Sewerage Act that entered into force on 01.11.2010 (hereinafter referred to as the PWSSA).

The methodology shall be applied for approving the following fees to be collected for the services of water supply and discharge and treatment of wastewater, storm water and drainage water and other soil and surface water (hereinafter referred to as *price for water service*):

- 1) a charge for water extracted;
- 2) a charge for the discharge and treatment of wastewater;
- 3) a charge for the discharge and treatment of storm water, drainage water and other soil and surface water;
- 4) a basic fee.

In addition the methodology shall be applied when approving the price list for services related to the main services set out in § 14<sup>2</sup> (1) of the PWSSA and the price for water service to be provided to other water undertaking pursuant to § 14<sup>2</sup> (2) of the PWSSA. In the price list for services related to the main services only these services are subject to approval that can be provided only by the water undertaking or only a water undertaking authorised by another water undertaking (i.e. services, for the provision of which there is no free competition).

The methodology shall be applied when approving the prices for water services in a similar and uniform manner when analysing the activity of all the water undertakings under the regulation of the CA and approving the prices thereof in order to avoid unequal treatment. This methodology can also be used by the local governments in approving the the prices for water services.

Provisions of § 14, 14<sup>1</sup> and 14<sup>2</sup> of the PWSSA have been taken into account when developing the methodology.

Pursuant to § 14<sup>2</sup> (1) of the PWSSA, if the water undertaking’s service are is located on a wastewater collection area, the pollution load of which is 2000 population equivalent or more, the water undertaking shall submit the proposal for the price for water service (hereinafter referred to as *price application*) with the price list for the services related to the main services and other documentation that services as the basis for the price application to the CA for approval.

In case the water undertaking is providing the water services on a wastewater collection area with a pollution load of both more or less than 2000 population equivalents, however, wishes to establish a common price for water service for these areas on the basis of the total costs, it shall submit the price application covering all wastewater collection areas also for the CA for approval (§ 14<sup>1</sup> (3) of the PWSSA). The remaining water undertakings shall approve their price for water services with the local governments (§ 14<sup>1</sup> (2) of the PWSSA).

When approving the prices, the last version, which is confirmed with the decree of the General Director, published on the website of the CA, shall serve as the basis.

In the development of the methodology, opinions were asked from the following institutions and companies: Ministry of Environment, Ministry of Economic Affairs and Communications, Environmental Investments Centre (KIK), Estonian Waterworks Association (EVEL), Estonian Cities’ Union, Association of Municipalities of Estonia, and the local governments of Tallinn, Tartu, Pärnu, Narva; larger water companies: AS Tallinna Vesi, AS Emajõe Veevärk, AS Pärnu Vesi, Narva Vesi AS, AS Tartu Veevärk.

## 2. Definitions

**2.1. Services subject to ex-ante regulation** – prices for water services to be approved before they are applied.

- 2.2. Services related to the main activity of the undertaking that are subject to ex-post regulation** – controllable prices and charges after they are applied (e.g. connection fees).  
prices/ charges to be reviewed by the regulator, e.g. the connection charges.
- 2.3. Investments into regulatory asset base** – nonrecurring costs for acquiring and improving regulated fixed assets.
- 2.4. Weighted Average Cost of Capital (WACC)** – the cost of total capital calculated on the basis of the capital structure (the ratio between own and external funds in the total capital) and the cost of debt and the cost of equity.
- 2.5. Capital expenditures (CAPEX)** – the expenses related to the acquisition of fixed assets, which are included in the price for water service sold.
- 2.6. Rate of depreciation (capital expenditure rate)** is the reciprocal of the time period that shows inclusion of the expenses incurred in the acquisition of fixed assets in the prices for water service. The rate of depreciations is determined by the useful life of the fixed asset.
- 2.7. Other activity i.e. the non-core activity** – fields of activity that are not directly related to the sale of water services (e.g. real estate developments, rent, construction, etc).
- 2.8. Justified return** – operating profit that is calculated as the product of the value of regulated asset base and the justified rate of return.
- 2.9. Justified rate or return** – rate of return from regulatory asset base that does not exceed the weighted average capital cost (WACC) of the undertaking;
- 2.10. Regulator** – CA or local government, who proceed from the methodology in the calculation of the price.
- 2.11. Regulation** – control of the activity of the water undertaking with the objective of approving the price for water service;
- 2.12. Regulation period** – 12-month period, the costs and justified return of which serve as the basis for calculating the prices.
- 2.13. Regulated activity** – economic activity of the undertaking regarding which the regulator applies the regulation.
- 2.14. Regulatory asset base (RAB)** – fixed assets and working capital used in the regulatory activity.
- 2.14. Return on regulated assets or justified rate of return** – an allowed rate of return on regulated assets i.e. return on regulated assets. The allowed rate of return of an undertaking may not be higher than the weighted average cost of the undertaking's capital (the WACC).
- 2.15. Operating expenses** – justified costs to be included in the price, which do not include capital cost and financial cost.
- 2.16. Water service** – service of water supply and discharge and treatment of wastewater, storm water and drainage water and other soil and surface.

### **3. Differentiation of expenses**

- 3.1.** Water undertaking and other provider of water service complying with the requirements set out in § 7 (5) of the PWSSA shall keep separate accounts for the expenses incurred in the sale of different goods and services.
- 3.2.** In the differentiation of expenses the provisions of § 7<sup>2</sup> of the PWSSA and §18 (2) of the Competition Act shall serve as the basis. In the accounting separate accounts shall be kept for the revenues and costs of each product or service, proceeding from the objectively justified accounting principles to be applied consistently, which need to be clearly specified in the accounting's internal rules. Accounts of revenues and costs must enable to assess whether the price of the product or service of the undertaking is in a reasonable ratio with the value of the product or service.
- 3.3.** In the accounting separate accounts are kept for on the costs by the following activities:
- 1) Water supply;
  - 2) Discharge and treatment of wastewater;
  - 3) Discharge of storm water, drainage water and other soil and surface water;
  - 4) Additional services related the activities named in clauses 1-3 of this subsection;
  - 5) Connection charges for connecting with the public water supply and sewerage;
  - 6) Other activities.

**3.4.** Fixed assets purchased with grant aid need to be separately brought out with the costs named in subclauses 1-4 of clause 3.3 of this methodology.

**3.5.** In case a customer or another water undertaking is provided with services on the territory of several local governments, water undertaking is required to keep separate accounting by different local governments by the activities listed in clause 3.3 of this methodology, except in cases, where the local governments have agreed otherwise (§ 7<sup>2</sup> (3) of the PWSSA).

**3.6.** During the approval of the prices it shall be reviewed that the expenses are differentiated based on justified principle and in the analysis of the costs an opinion regarding the division thereof shall be provided.

## **4. Sales volumes, operating expenses to be included in the prices, the analysis and justification thereof**

**4.1.** During the approval of the prices, the sales forecasts that are submitted by the undertaking and that serve as a basis for the formation of the price for water service shall be analysed. In the analysis of the sales forecasts the following methods shall be used:

- Change in the sales forecast (incl. changes in the economy forecasts, water consumption and other indicators forecasted in the long-term development plan shall be taken into account);
- Comparison of the sales volumes of the previous period;
- Dynamics and forecast of the number of consumers.

**4.2.** When calculating the water service sales volumes, an assumption is taken as the basis that all consumers consume water service for 12 months. Making this assumption is necessary in order to maintain the balance between the costs and consumption that serve as the basis for calculating the price for water service. As the costs, incl. the investments, correspond to 12 months, then the customers' consumption volume must also correspond to the consumption volume of 12 months, or else the price would be formed on an unjustified bases.

**4.3.** Costs incurred by the undertaking are divided in their nature into controllable and uncontrollable.

**4.4.** Controllable costs are these that the undertaking may influence through a more efficient economic activity. *E.g. water loss in providing the PWSS services, as the undertaking may control this cost item through investments and more efficient economic activity. Also labour costs, etc.*

**4.5.** Uncontrollable costs cannot be influenced through the economic activity of the undertaking, but are entirely subject to external factors (above all to legislation). Uncontrollable costs are for example:

1. Fees for water service paid to other water undertaking (*in case these have been approved pursuant to § 14<sup>1</sup> (2) of the PWSSA*);
2. Rates for environmental taxes set out in the law;
3. Prices that can be administratively regulated;
4. Other duties and obligations resulting from the law.

**4.6.** A principle of complete reflection in prices for water services shall be applied for uncontrollable cost. *E.g.: rates set out in the law shall be taken as the basis for calculating the costs, however, the undertaking must justify the pollution volumes.*

**4.7.** The following cost items shall not be included in the prices for water service:

1. Costs for bad debts;
2. Sponsorship, gifts and donations;
3. Fees paid to the mediators of water service;
4. Costs related to non-core activity;
5. Penalties and fines for delay imposed to the undertaking by legislation;
6. Financial costs;
7. Undertaking's income tax cost (e.g. cost for income tax paid on dividends);
8. Other costs that proved to be unjustified during the economic analysis of the activity of the undertaking.

**4.8.** When approving the prices, the division of expenses between various products and services sold by an undertaking is analysed and it is monitored that the products and services sold would not include a cross-subsidization of the fields of activity.

**4.9.** In the systematic performance of the analysis of the undertaking's costs, the following methods among others are used:

1. Observing the dynamics of costs in time and the comparison thereof with the dynamics of the CPI;
2. In-depth analysis of the justifiability of various cost components (incl. expert opinions);
3. Comparison of the operating expenses of the undertaking and the statistical indicators calculated on the basis thereof with the indicators of other undertakings.

## **5. Regulatory asset base and capital expenditure**

**5.1.** It is necessary to determine the regulatory asset base:

1. For calculating the capital expenditure (depreciation of asset);
2. For calculating the justified return, because when regulating the activities of an undertaking, RAB is equalled with the capital invested into the undertaking by the undertaker.

**5.2.** Connection fees paid to other water undertakings shall be calculated into the regulatory asset base.

**5.3.** The following shall not be included into the regulatory asset base:

- 1) Fixed assets used in non-core activity;
- 2) Long-term financial investments;
- 3) Intangible fixed assets (except for computer software and programmes' licences and connection fees paid to other water undertakings);
- 4) Fixed assets acquired through government grant (e.g. EU foreign aid programmes);
- 5) Fixed assets acquired from the connection fees paid by the consumers;
- 6) Unjustified investments.

**5.4.** Capital expenditure is the expenses related to the acquisition of assets, which are included in the temporary prices for water services.

**5.5.** The aim of the capital expenditure is to recover the expenses made for the acquisition of fixed assets through the price for the water service during the useful life of the fixed assets. Exemptions include sites with an unlimited useful life (e.g. land) that are not depreciated.

**5.6.** Capital expenditure is calculated from the depreciable fixed assets included within the regulatory asset base.

**5.7.** When calculating the value of regulatory asset base, the residual book value at the end of the accounting period is used. In the calculation of the capital expenditure, depreciation rate on regulatory assets base reflected in the accounting shall be used.

**5.8.** The RAB at a regulation period is calculated as follows:

$$\mathbf{RAB = RAB_r + WC,}$$

Where

RAB – regulated asset base;

RAB<sub>r</sub> – residual book value of RAB in the end of a regulation period;

WC – working capital.

Formula 1

**5.9.** 5% of the allowed sales revenue of the regulation period shall be taken as the basis for calculating the working capital.

**5.10.** The internal turnover of companies belonging to a vertically integrated group is not included in the calculation of working capital.

**5.11.** One of the bases for approving the prices for water service is the investment programme carried out by the undertaking, serving as the basis for calculating the capital expenditure and justified return (operating profit). The delivery of the actual investments pursuant to the submitted investment programme is monitored during the analysis.

**5.12.** If the total cost of investments made in the regulation period is less than the investment programme planned in RAB, then only the investments that have been actually made shall be included in the RAB in the following period

**5.13.** If after 31.12.2009 revaluations of fixed assets reflected in the accounting of the undertaking have been performed and/or the depreciation rates of fixed assets have been changed considerably or if the depreciation rates of the fixed assets do not comply with the useful lifetime thereof, then a calculation of RAB and capital expenditure shall be performed as stipulated in clause 5.14.

**5.14.** Calculation of RAB and capital expenditure according to clause 5.13 of this methodology:

- 1) As from 31.12.2009 the fixed assets of the water undertaking are divided into old (fixed assets acquired before the margin year) assets and new (fixed assets acquired since the margin year) assets.
- 2) In the calculation of capital expenditure, separate accounts shall be kept for the assets acquired before and after the margin year, and thus also a separate account of the capital expenditure shall be kept.
- 3) In the calculation of capital expenditure the linear capital expenditure calculation method is applied.
- 4) There is a right to make adjustments to the cost of fixed assets and capital expenditure rates in case it becomes evident that the fixed assets acquired either before or after the margin year include assets that the undertaking is not actually employing for carrying out its economic activity or in case it becomes evident that the capital expenditure rates are not justified.
- 5) Capital expenditure on fixed assets acquired before the margin year shall be reported at its residual value. Thereby capital expenditure rate(s) shall be established for fixed assets acquired before the margin year, based on which the calculation of capital expenditures to be included in the prices shall take place.
- 6) Capital expenditure on fixed assets acquired after the margin year shall be reported at its acquisition value. Thereby capital expenditure rate(s)<sup>1</sup> shall be established for the fixed assets acquired after the margin year, based on which the calculation of capital expenditures to be included in the prices shall take place.
- 7) If necessary, the differentiation of assets may be used, by using different capital expenditure rates.
- 8) Capital expenditure is not calculated from the fixed assets acquired for the connection fees paid by consumers.
- 9) Capital expenditure to be included in the prices is calculated in the following way:

$$A_{prices} = A_{before\ m.y} + A_{after\ m.y}$$

Formula 2

$A_{prices}$  – capital expenditure to be included to the prices;  
 $A_{before\ m.y}$  – capital expenditure on fixed assets acquired before the margin year;  
 $A_{after\ m.y}$  – capital expenditure on fixed assets acquired after the margin year.

- 10) Capital expenditure is calculated from fixed assets acquired before the margin year as follows:

$$A_{before\ m.y} = N-CA_{residual} v_{before\ m.y} \times rate_{before\ m.y}$$

Formula 3

$N-CA_{residual} v_{before\ m.y}$  – fixed assets at residual value acquired before margin year;  
 $rate_{before\ m.y}$  – capital expenditure rate established for fixed assets acquired before margin year.

- 11) Capital expenditure is calculated from fixed assets acquired after the margin year as follows:

$$A_{after\ m.y} = (N-CA_{acquisition} c_{after\ m.y} + 0,5 \times I) \times rate_{after\ m.y}$$

Formula 4

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<sup>1</sup> When determining the capital expenditure rates for fixed assets acquired after the margin year, the useful life of assets included in clause 10 in Annex 2 of the Minister of Environment Regulation No 34 of 01.07.2009 “Guidelines for preparing the feasibility study, the financial and economic analysis and provisional assessment of environmental impacts for the project in case the project’s co-financing application is submitted to the Cohesion Fund of the European Union “ shall be taken as the basis.

$NCA_{residualv_{after\ m.y}}$  – fixed assets at acquisition cost acquired after margin year;  
 $I$  – investments made into the regulated fixed assets during the regulation period;  
 $Rate_{after\ m.y}$  – capital expenditure rate established for fixed assets acquired after margin year.

12) Calculation of RAB:

$$RAB = (RAB_0 + RAB_1)/2 + WC,$$

Where

Formula 5

RAB – Regulated asset base;

$RAB_0$  – residual book value of RAB in the beginning of a regulation period;

$RAB_1$  – residual book value of RAB in the end of a regulation period;

WC – working capital.

13) The value of RAB in the end of a regulation period is calculated as follows:

$$RAB_1 = RAB_0 + I - A - M,$$

Where

Formula 6

$RAB_0$  - residual book value of RAB in the beginning of regulation period;

$RAB_1$  – residual book value of RAB in the end of regulation period;

$I$  – investments made into RAB;

$A$  – capital expenditure;

$M$  – fixed assets sold or written off.

**5.15.** The calculation of RAB is consistent and continues in all further regulation periods and also in case the undertaking or the ownership of assets changes.

**5.16. Example: Calculation of capital expenditure and RAB**

- 1) The company's financial year begins on 1 January. Margin year is set on 2010 (as the book value of RAB is fixed on 31.12.2009).
- 2) As at the beginning of the financial year 2010, the residual value of the undertaking's regulated assets is 200 million EEK;  $N-CA_{residualv_{before2010}} = 200$  million EEK;
- 3) A capital expenditure rate of 10% is established for the assets acquired before the financial year 2010;  $norm_{before2010} = 10\%$
- 4) During the financial years 2010 and 2011, investments are made to the scale of 10 million EEK; as at 1 January 2010  $N-CA_{acquisitionc_{after2010}} = 10$  million EEN and as at 1 January 2011  $N-CA_{acquisitionc_{after2010}} = 20$  million EEK.
- 5) A capital expenditure rate of 3.33% is established for the assets acquired after the financial year 2010;  $rate_{after2010} = 3.33\%$

Table 1. Example of the calculation of capital expenditure and RAB.

	2010	2011
<b>Allowed sales revenue</b>	<b>10 000</b>	<b>10 000</b>
Value of assets at the beginning of the year (th'EEK)	200 000	189 834
Value of old assets (th'EEK)	200 000	200 000
Capital expenditure rate of old assets %	10	10
<b>Capital expenditure of old assets (th'EEK)</b>	<b>20 000</b>	<b>20 000</b>
Investments (th'EEK)	10 000	10 000
Capital expenditure rate of new assets %	3,33	3,33
<b>Capital expenditure of new assets (th'EEK)</b>	<b>167</b>	<b>500</b>
<b>Total regulative capital expenditure (th'EEK)</b>	<b>20 167</b>	<b>20 500</b>
Value of assets at the end of the year (th'EEK)	189 834	179 334

Working capital (th'EEK)	500	500
Regulatory asset base (th'EEK)	195 417	185 084

## 6. Calculation of justified return

**6.1.** Justified return is calculated on the basis of applying a justified rate of return on RAB.

**6.2.** Justified return is calculated as a product of RAB and the justified rate of return. Justified return is calculated based on the following formula:

$$\mathbf{JR = r_j \times RAB,}$$

Where

Formula 7

JR - Justified return;

R<sub>j</sub> - allowed rate of return (WACC);

RAB - regulatory asset base

**6.3.** Justified rate of return equals with WACC:

$$\mathbf{R_j = WACC,}$$

Where

Formula 8

WACC – weighted average cost of capital

**6.4.** WACC is calculated based on the following formula:

$$\mathbf{WACC = C_{equity} \times \left( \frac{E}{D + E} \right) + C_{debt} \times \left( \frac{D}{D + E} \right)}$$

Where

Formula 9

C<sub>equity</sub> - cost of equity (%)

C<sub>debt</sub> - cost of debt (%)

D - proportion of debt (%)

E - proportion of equity (%)

**6.5.** The calculation of the capital structure of WACC is not based on the undertaking's book data. In the conditions of market regulation, the regulator may intervene in the financing decisions of undertakings and dictate a certain capital structure or calculate the prices of services with a certain capital structure, which may differ from the actual capital structure<sup>2</sup> of the undertaking. Due to that the regulator uses a capital structure of 50% debt and 50% equity in the calculation of WACC.

**6.6.** When determining the cost of debt, the interest levels of a long-term periodic money market (the average of 5 last years of German 10 year bonds), country risk and company risk are taken as the basis. In case state bonds exist, the cost of debt may be determined on the basis of the interest rate of a state bond.

**6.7.** The cost of equity is calculated according to the CAPM model as follows:

$$\mathbf{C_{equity} = R_f + R_c + \beta \times R_m,}$$

Where

Formula 10

C<sub>equity</sub> - cost of equity

R<sub>f</sub> - risk-free rate of return

R<sub>c</sub> - country risk premium

β - beta coefficient

R<sub>m</sub> - market risk premium

**6.8.** Risk-free rate of return is regarded as the 5-year average interest rate of a German 10-year bond, to which the country risk premium is added. In case state bonds exist, the interest rate of state bonds may be regarded as the risk-free rate of return.

**6.9.** Beta coefficient is determined on the basis of the respective indicator of other European and/or US regulated companies.

**6.10.** The market risk premium is determined on the basis of long-term market risk premiums of other European and/or US regulated companies.

## **7. Calculation of the allowed sales revenue and prices for water services**

**7.1.** The allowed sales revenue serves as the basis for the calculation of the prices for water service. The allowed sales revenue ( $R_{\text{allowed}}$ ) is the sales revenue from water service in the regulation period.

**7.2.** The following costs shall be included in the prices for water service:

1. Operating expenses;
2. Capital expenditure;
3. Justified return.

Hence the allowed sales revenue is calculated as follows:

$$R_{\text{allowed}} = OE + CE + JR,$$

Where

Formula 11

$R_{\text{allowed}}$  - allowed sales revenue;

OE - Operating expenses;

CE - Capital expenditure;

IR - Justified return.

**7.3.** In case subsidy has been received from national or European Union funds for the development of the PWSS, the liabilities assumed for receiving the non-returnable aid shall be taken into account in approving the prices for water services (§ 14 (10) of the PWSSA).

**7.4.** In case subsidy has been received from national or European Union funds for the development of the PWSS, then it will be checked whether the allowed sales revenue is sufficient for ensuring a free cash flow for the water undertaking for fulfilling the loan commitments received at reasonable terms. If necessary, the amount of capital expenditure rate of the fixed assets acquired with the loans taken for receiving non-returnable aid will be amended.

**7.5.** On the basis of the principle of dividing operating expenses, capital expenditure and justified return that have been submitted by the water undertaking and considered as justified within the analysis, the allowed sales revenue is divided into the allowed sales revenues of various water services in such a manner that the following formula applies:

$$R_{\text{allowed}} = \Sigma R_{\text{allowed}_n}$$

Where

Formula 12

$R_{\text{allowed}_n}$  – allowed sales revenue of the respective service;

n - water service.

**7.6.** Allowed sales revenues of the respective water service serves as the basis for calculating the prices of specific water services as follows:

$$\text{price}_n = R_{\text{allowed}_n} / m_n \text{ [e.g. kr/m}^3\text{; kr/month]}$$

Where

Formula 13

$R_{\text{allowed}_n}$  – allowed sales revenue of the respective service during the regulation period;

$m_n$  - sales volume of the respective public water supply and sewerage service during the regulation period;

price<sub>n</sub> - price for the respective water and sewerage service during the regulation period.

7.7. Allowed sales revenue is formed as a sum of the products of the prices of various water services and the sales volumes thereof:

$$R_{\text{allowed}} = \Sigma (\text{price}_n \times \text{sales}_n)$$

Formula 14

Where

price<sub>n</sub> – price of the specific water service;

sales<sub>n</sub> – volume of the water service sold at the respective price.

7.8. An example of calculating the allowed sales revenue:

The table below indicates the costs that serve as the basis for calculating the allowed sales revenue and prices for the respective services.

Table 2. An example of calculating the allowed sales revenue.

		<b>Total allowed sales revenue</b>	<b>Charge for water supplied</b>	<b>Charge for discharge and treatment of wastewater</b>
Expenses on buying services from other water companies	kr	1,000,000	350,000	650,000
Uncontrollable expenses	kr	20,000	5000	15,000
Operating expenses	kr	1,000,000	400,000	600,000
Capital expenditure	kr	200,000	75,000	125,000
Justified return	kr	250,000	100,000	150,000
<b>Allowed sales revenue</b>	<b>kr</b>	<b>2,470,000</b>	<b>930,000</b>	<b>1,540,000</b>
Sales volume	m <sup>3</sup>		80,000	80,000
<b>Charge for services</b>	<b>Kr/ m<sup>3</sup></b>		<b>11.6</b>	<b>19.3</b>