

Water and Waste Regulatory Office
Water Supply Tariff Setting Procedures
Preliminary draft – outline concepts etc.

Draft 03

December 2007

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PREAMBLE

[Disclaimer: This document is a provisional first draft to be used as a basis for discussion only]

This first draft of the tariff determination procedures sets out the WWRO's initial proposals for the tariff determination calculation process. The information necessary for these procedures to be applied may not be readily available and a degree of regulatory discretion may be required. This does not mean arbitrary 'guesses' but rather the application of professional judgement and the maximum utilisation of whatever information is available.

Important in these procedures is the setting out of a regulatory calendar, prescribing a reasonably detailed timetable for information requests, submissions, consultation and approval processes. It is important that WWRO and the regional water supply service providers comply with this planned programme in order to meet the specific deadlines for the new tariffs to be applied.

An important element of the programme includes a model development and testing phase. This requires the co-operation and support of the regional water supply service providers in providing the necessary data (audited or un-audited) to allow such tests to be carried out in such a manner that the results, as close as possible, reflect real costs and sales performances.

The application of these procedures is entirely dependent upon the regional water supply service providers providing the necessary information to WWRO. It is important that the regional water supply service providers provide the requested information to WWRO with its tariff application. Where appropriate the information required for periodic reporting should employ similar definitions as in these procedures in order to effectively monitor actual performance against the assumptions made in tariff reviews and to reduce the opportunity for unnecessary duplication and misinterpretation.

These procedures in several places offer variants to be considered by the WWRO, namely: current cost depreciation, regulatory capital value, return on capital and smoothing. With the exception of smoothing, the WWRO shall require guidance from government as to the most appropriate variant to apply. The results of the testing programme may determine the selected variants.

Throughout these procedures there are comments denoted by *[italics in square brackets]*. These comments do not form the content of the procedures but provide comments on logic applied, areas where decisions need to be reached and assumptions that may have to be made. Such comments may be removed from the final version of the procedures but are included in this document to facilitate debate and discussion prior to the adoption of a final set of procedures.

These procedures are based upon good regulatory practice adopted in many other parts of the world but adapted to meet the specific circumstances and operating environment within Kosovo. In certain areas the procedures include definitions and processes documented in guidelines and procedures of other reputable regulatory agencies, notably the Water Services Regulatory Authority (Ofwat), the water industry regulator in England and Wales. In addition these procedures have employed some aspects of the tariff determination methodology prepared by Shugart and Alexander (2006) 'Improving the regulation of water and sanitation services - Development of low-discretion tariff adjustment Rules' developed on behalf of the water industry regulators in Australia.

1. DEFINITIONS

Adopted assets: Fixed assets financed by a developer or user where the ownership is transferred to the utility, the value of which is not added to the regulatory capital value.

Broad equivalence: the concept whereby the long run costs of maintenance expenditure are comparable to the long run current cost depreciation charge in a steady state condition.

Capital asset pricing model: An economic rationale for determining the risk return relationship and hence the returns expected of specific industry types, e.g. water supply.

Capital contributions: Finance provided as a contribution towards an investment by a third party, e.g. infrastructure charges and contributions for activities such as pipeline diversions.

Capital maintenance: Planned work carried out by the regional water supply service providers to replace and repair and water supply assets to provide a base service to customers.

Current cost accounting: A method of accounting originally designed to deal with the problem of showing the effect of inflation on business profits. Instead of showing assets at their historic cost (i.e. their original purchase price), less depreciation where appropriate, the assets are shown at their current cost (replacement cost) at the time of producing the accounts. This method of accounting is used in the water industry because of the extensive nature of capital assets and the fact that historic costs do not reflect the asset's true worth. *[without detailed replacement costs a surrogate that can be applied in the first instance is actual costs subject to inflation indexation]*

Current cost depreciation: Depreciation calculated in accordance with current cost accounting methods.

Customer-number-related operating costs: Operating costs that are related to the number of customers, e.g. meter reading, billing etc.

Enhanced service levels: Permanent, identifiable and measurable improvements in service levels that are above the current base level.

Enhancement: To enhance and grow the asset base through enhanced service levels and/or system expansion.

Ex-ante: A calculation methodology based upon projections of costs and revenues.

Fixed-costs: Operating costs that are unrelated to the number of customers and unrelated to the volume of water

Grants: Finance provided for investment or the provision of services for which no repayment is required. This includes a grant equivalent of the conversion of concessionary (soft) loans to grant and commercial loan. Infrastructure investment financed by grants is neither added to the infrastructure renewals charge nor the regulatory capital value.

Indexed: Costs and revenues adjusted for inflation in accordance with inflation indices

Infrastructure assets: Mainly underground assets, such as water mains and also dams and reservoirs that last for a long time. A distinction is drawn between infrastructure and non-infrastructure assets because of the way in which the assets are managed, operated and maintained by the regional water supply service providers.

Infrastructure charges: Paid by developers and customers in new properties for either a first time connection of premises for domestic purposes to a public water supply or a public sewer.

Infrastructure renewals charge: An annual accounting provision for expenditure on the renewal of infrastructure (i.e. mainly underground) assets charged to the regulatory profit and loss account.

K factor: A factor expressed as a percentage that reflects the real increase or decrease in tariffs before inflation adjustments.

Non Revenue Water (NRW): The volume of water treated and entering the system that does not generate income for the regional water supply service providers.

Non-infrastructure assets: Mainly surface assets such as water treatment works, pumping stations and company laboratories, depots and workshops.

Non-recoverable debts: An allowance for payments due to the regional water supply service providers for which there is no reasonable prospect for receiving payment and would effectively qualify to be written off in accordance with conventional accounting practices.

Operating costs: Direct operating costs related to providing the service including: labour; energy; chemicals; consumable materials; overheads; non-recoverable taxes and other recurrent expenditure.

Real prices: Costs and revenues expressed in prices as at a set date, e.g. mid 2008.

Regulatory calendar: A timetable of activities to be undertaken by the regional water supply service providers, WWRO and others in order to meet their time-bound obligations. The activities include preparation of procedures, consultation, testing, information requirements, tariff submissions, approval, and adoption.

Regulatory capital value: The capital base used in setting price limits and is the value of the regional water supply service providers which earns a return on investment. It represents the opening value of the investments made and debt, working capital, government equity [*subject to government policy*], and net new capital expenditure. The capital value is calculated after current cost depreciation.

Return on capital: a fair return on the regulatory capital value represented as the annual income and capital growth from an investment, expressed as a percentage of the original investment.

Revenue requirement: The annual income requirement necessary to finance the activities of the regional water supply service providers including a return on capital. It includes; operational costs; infrastructure renewals charge; current cost depreciation; return on capital and other costs as appropriate.

Risk premium: The return over and above the risk free return that reflects the sector or business risk.

Smoothing: The process of adjusting tariff outputs to replacing excessive price fluctuations by equivalent uniform (or near uniform) percentage adjustments, but still maintaining the same net present value of the revenue stream.

Supply demand balance: The gap between supply and demand, either through the demand from new customers or increased demand from existing customers, for which additional investment is required to ensure that the demand for services is satisfied.

Un-indexed: Costs and revenues that are not adjusted for inflation.

Volume-related operating costs: Operating costs that are related to the volume of water, e.g. raw water charges, chemicals for treatment and energy for pumping

Weighted average cost of capital (WACC): The weighted average of debt interest and equity investor expectations expressed as a percentage return on total capital.

Working capital: The capital required to finance the recurrent costs of the regional water supply service providers. In the context of these procedures the working capital is not necessarily the strict accounting definition but rather one that reflects the actual needs of the regional water supply service providers, e.g. three months turnover.

2. GENERAL CONCEPTS

2.1 The regional water supply service providers

- 2.1.1 The pricing methodology adopted for the regional water supply service providers is based upon their status as public owned entities and are subject to the companies code of Kosovo. They do not currently generate dividends for their shareholders and all net proceeds are effectively re-invested in the businesses. Consequently the imposition of a pricing regime that effectively penalises poor performance, or claws back additional returns of out-performance are, to a degree, self-defeating. Although the methodology presented in these procedures is based upon conventional economic regulatory principles the more complex features of adjustments for under performance and out-performance that are normally employed in privately owned utility structures (divestiture or longer term concessions) are of limited importance and are thus significantly simplified in these procedures. This does not, however, mean the that WWRO should not take an interest in performance and profitability but rather be satisfied that that performance is in line with expectations and that the regional water supply service providers are on the path of meeting the goal of financial sustainability and meeting their service obligations in accordance with EU and Kosovo standards.

2.2 Obligations, policy and guidelines

- 2.2.1 These procedures set out the detailed proposals for water tariff setting. They are based upon the statutory obligations as set out in *Regulation No 2004/49 on the Activities of Water, Wastewater and Waste Services Providers*. They also adhere to the principles of the WWRO Water Tariff Policy (2007).

2.3 Water tariff calculation principles

- 2.3.1 The determination of water tariffs is based upon the prices set to satisfy a revenue requirement by the regional water supply service providers. This revenue requirement includes for:

Operating costs: labour, energy, consumable materials, chemicals, overheads, non-recoverable taxes, and recurrent expenditure

Capital maintenance: infrastructure renewals charges, depreciation and other appropriate mechanisms

Return on capital: a fair return on the regulatory capital value of the assets financed by the regional water supply service providers.

- 2.3.2 A fundamental principal of these procedures is that the regional water supply service providers shall be entitled to a revenue stream sufficient to finance its activities but at the same time shall ensure that its return on capital is limited to a fair representation of the investments made by the regional water supply service providers, e.g. investments financed through grants shall not qualify as capital upon which a return can be earned.
- 2.3.3 These procedures are based upon a periodic review (3 years).
- 2.3.4 A significant element of the revenue requirement upon which the tariff is calculated is the financing necessary for capital maintenance, upgrading and system refurbishment. These procedures are based upon the assumption that the allowances provided for in the revenue requirement reflect actual expenditure. Where expenditure is above or below such provisions interim adjustments to the prices shall be made. These procedures, therefore, are designed to eliminate, as far as possible, incentives for the postponement of such capital maintenance, upgrading and system refurbishment.

2.4 Real prices

- 2.4.1 All costs determined are to be adjusted to the price level at the mid-point of the year preceding the commencement of the price review period.
- 2.4.2 The tariff for the first year of the tariff review period shall be set on the price base of the mid-point of the preceding year multiplied by the inflation index for the preceding year.

- 2.4.3 Subsequent tariffs shall be adjusted by the preceding year inflation figures.
- 2.4.4 Tariffs shall be subject to the real increases (or decreases) as determined by these procedures *[unsmoothed adjustments or smoothed adjustments depending upon the approach adopted]*

2.5 Efficiencies

- 2.5.1 In this first three year review there is no efficiency savings to be brought forward. However, in the next review the procedures should allow for any efficiency benefits beyond those expected by the WWRO to be retained by the regional water supply service providers for a defined period *[OFWAT allows efficiency benefits to be retained for five years]* irrespective of when the efficiencies were realised.

2.6 Smoothing

- 2.6.1 The procedures are designed to smooth prices over the three year review period to limit the adverse impact of price shocks and fluctuations.

2.7 Financial statements

- 2.7.1 The projected regulatory financial statements for the regional water supply service providers shall be a principal output of these procedures. These statements shall include:
1. Regulatory balance sheet (including regulatory capital value)
 2. Regulatory income statement
 3. Cash flow
- 2.7.2 The projected financial statements shall be compared with the actual performance and where appropriate may be used to identify legitimate triggers for extra-ordinary price adjustments.

3. MODEL OVERVIEW

3.1 Timetable

3.1.1 It is necessary for WWRO to develop a 'regulatory calendar' setting out a strict timeframe for the issuance of draft and final tariff determination procedures (this document) including information requirements, submission of tariff proposals with accompanying data, review of proposals and independent assessment of tariffs, WWRO response to tariff proposals, final deliberations / negotiations, approval of tariffs and adoption. The following timetable for the 2009 – 2011 tariff review period is proposed:

No later than	Activity	Responsible party
31 Dec 2007	Development and issuance of draft Tariff Determination Procedures including information requirements	WWRO
	Commencement of data collection and forecasting activities	Regional water supply service providers
31 Jan 2008	Review of procedures and the regional water supply service providers comments	Regional water supply service providers
28 Feb 2008	Consideration of comments, review and amendment of procedures, and issuance of revised Tariff Determination Procedures	WWRO
30 Apr 2008	Preliminary 'testing' of procedures using preliminary data	WWRO in close collaboration with the regional water supply service providers
31 May 2008	Review of test results, amendment of procedures (if required) and issuance of Final Tariff Determination Procedures	WWRO
30 Jun 2008	Submission of tariff proposals, business plans and supporting information based upon Final Tariff Determination Procedures	Regional water supply service providers
30 Sep 2008	Detailed review of tariff proposals including detailed scrutiny of submitted information and formal response to the regional water supply service providers (including alternative tariff proposals)	WWRO
30 Oct 2008	Approval of tariffs by WWRO and publication	WWRO
1 Jan 2009	Adoption of tariffs	Regional water supply service providers
31 May 2009	Submission of actual 2008 data for comparison against projections submitted in the tariff review	Regional water supply service providers
1 Jan 2010	Adjustment of tariffs in accordance with tariff programme and inflation criteria	Regional water supply service providers
31 May 2010	Submission of actual 2009 data for comparison against projections submitted in the tariff review	Regional water supply service providers
1 Jan 2011	Adjustment of tariffs in accordance with tariff programme and inflation criteria	Regional water supply service providers
31 May 2011	Submission of actual 2010 data for comparison against projections submitted in the tariff review	Regional water supply service providers
30 Jun 2011	Submission of tariff proposals, business plans and supporting information based upon Final Tariff Determination Procedures	Regional water supply service providers

[The above timetable is based upon an initial assessment only and a revised timetable may be required in the light of additional information. However, it is important at the outset to develop a relatively strict timetable without which it may not be possible to ensure compliance with the desired end result]

3.2 Model platform

3.2.1 The procedures comprise a calculation process comprising a series of MS Excel spreadsheets *[In this preliminary draft the spreadsheets have not yet been developed]*. Each spreadsheet comprises a specific component of the model:

1. Demand and sales model (tariff denominator)
2. Regulatory capital value
3. Revenue requirement (tariff numerator)
 - i. Operational costs
 - ii. Infrastructure renewals charge
 - iii. Depreciation (calculated on a current cost basis)
 - iv. Return on capital
 - v. Other costs *[if required]*
4. Tariff calculation
 - vi. Annual tariffs
 - vii. Smoothed 'adjusted' tariffs

3.3 Input data sources

3.3.1 The input data required in the model will be derived from various sources including:

1. Audited (and un-audited) financial statements from the regional water supply service providers, e.g. detailed income statements, asset registers, loan schedules, cost centre records, performance reports etc.
2. Business plans of the regional water supply service providers, e.g. production and sales projections (including NRW assessments), revenue collection projections, operational cost projections investment plans (including backlogs of capital maintenance), expanded service expectations, debt coverage requirements (interest and loan repayments), etc.
3. Government of Kosovo, e.g. cost of capital, policies related to regulatory capital value, etc.
4. Other sources, e.g. inflation statistics, interest rates, income levels etc.

3.3.2 Detailed definitions of the individual data requirements are included in as an annex to these procedures *[not developed in this first draft]*.

[It may not be possible for the respective parties to collate and provide all the data as set out in these procedures for the determination of tariffs the first three year review, in which case WWRO, in consultation with the regional water supply service providers may be required to make 'best estimates' based upon the best information available to them at the time. This does not give license to the regional water supply service providers to abrogate their information reporting responsibilities but rather that they should improve their information systems to meet the requirements of WWRO. It is expected that during the three year tariff review period (2009 – 2011) improved information reporting systems will allow WWRO to re-evaluate the tariff determinations and, if considered appropriate, adjust tariffs based upon this improved information.]

3.4 Model concept

3.4.1 The model is based upon the determination of tariffs for each year that will provide a revenue stream equivalent to the revenue requirement (including a return on capital where appropriate). The average tariff for each year is the revenue requirement divided by the expected volume of sales for that year.

3.4.2 The revenue requirement is determined on the basis of meeting real cash flow demands and does not necessarily pass through non-cash items (depreciation and asset / liability

revaluation adjustments, e.g. foreign exchange losses) except where such pass through is considered both prudent and acceptable.

- 3.4.3 The revenue requirement includes efficient operational costs, the costs of capital maintenance, and a return on capital. *[Taxation can be added to these costs but for the purposes of the current tariff review it is assumed that the regional water supply service providers do not generate sufficient revenues to be liable for tax, or, has built up a sufficiently large tax shield to offset any potential profits that would otherwise be subject to taxation]*
- 3.4.4 The treatment of capital maintenance depends upon whether such costs are for the maintenance of infrastructure (underground) assets or non-infrastructure assets (refer Sections 7 and 8).
- 3.4.5 The costs of operational activities, including capital maintenance of infrastructure assets, financed through grants are not included in the revenue requirement.
- 3.4.6 Capital investments in infrastructure enhancement that are grant financed are not added to the regulatory capital value.
- 3.4.7 Capital investment in non-infrastructure assets are added to the RCV net of grant contributions and the grants are written off over the life of the assets.
- 3.4.8 The regulatory capital value is based upon an opening value *[to be determined]* and it is increased through new investments (net of grants and capital contributions) and decreased by depreciation calculated on a current cost accounting basis.
- 3.4.9 The return on capital is based upon a 'fair' return that reflects the cost of capital to the regional water service providers (interest rates and equity return expectations).
- 3.4.10 The overall concept of the procedures is illustrated in Figure 1.

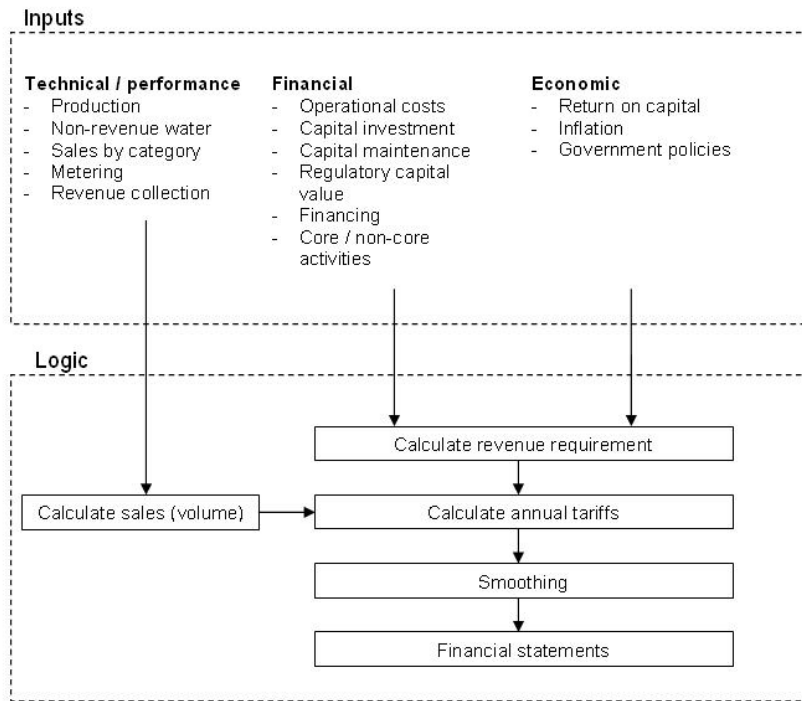


Figure 1 – Model overview

4. SALES CALCULATION

4.1 Logic

- 4.1.1 The overall sales projections are based upon the business plans of the regional water supply service providers but subject to regulatory scrutiny and, where appropriate, adjustment to reflect WWRO expectations of improved performance.
- 4.1.2 The expected total annual water sales (m³) are determined on the basis of:
Sales in year = Previous year sales + increase in production¹ + reduction in NRW
- 4.1.3 The increases in production shall reflect any investment in service enhancement (supply demand balance and level of service) expectations, notably service expansion. The regional water supply service providers shall provide supporting data where required.
- 4.1.4 Water sales projections shall be broken down into customer categories, e.g. domestic, non-domestic etc. The regional water supply service providers shall provide sufficient information to ascertain reasonable estimates of such projections by category.
- 4.1.5 The projected number of customers (by category) for each year is required to determine the basis upon which connection fee revenue is determined and to be removed from the revenue requirement for the determination of the tariff. Similarly, the costs associated with the installation of connections are required to be estimated and excluded from the revenue requirement on the basis that such costs are matched by connection fees.
- 4.1.6 The projected volumes of water sales based upon estimates, due to faulty meters or meters not installed, by category is required to determine the degree to which the revenue may be affected by the metering programme and whether the impact exceeds pre-defined boundaries that may trigger an interim adjustment.
- 4.1.7 Water sales projections by category shall be adjusted to reflect non-recoverable debts (non-payment). The adjustments for non-recoverable debts shall be subject to the scrutiny of the WWRO in determining an appropriate level of non-recoverable debt².

4.2 Information requirements

- 4.2.1 The principal information requirements for this component of the model include:

Ref	Item	Unit	Source	Remarks
	Estimated water sales projections by category	m ³ per year	Regional water supply service providers' business plan	Sales to be identified on the basis of customer type, e.g. domestic/ non-domestic etc.
	Production projections	m ³ per year	Regional water supply service providers' business plan	Required to determine volume related costs, e.g. energy
	NRW projections	m ³ per year	Regional water supply service providers' business plans	NRW required for water balance. Reductions in NRW should equate to increased sales and/or reduced production.
	Existing and projected numbers of customers by category	No by year	Regional water supply service providers' business plans	For simplicity take average of each year

¹ This is estimated production output and is not to be confused with production capacity.

² The level of non-recoverable debt shall not include provisions for late payment. Non-recoverable debts are defined as those for which there is no real prospect of payment, e.g. commercial customers that have become insolvent, domestic customers who have been disconnected and show no willingness to be reconnected, customers whereby there is no willingness to pay and the sanction of disconnection cannot be applied, etc. Non-recoverable debts are those that qualify to be written off as bad debts.

Ref	Item	Unit	Source	Remarks
	Projected volumes metered and un-metered	m ³ per year	the regional water supply service providers business plans	This may be required to evaluate interim tariff adjustments if the metering programme deviates from expectations resulting in either excessive windfall gains or losses
	Revenue collection performance expectations by category	% by category and year	the regional water supply service providers business plans	Required to determine the degree to which tariffs are required to cover non-payment.

5. REVENUE REQUIREMENT OVERVIEW

- 5.1.1 The revenue requirement represents the income required by the regional water supply service providers in order for it to meet the cost of running its business and to fund its investment programme. It is calculated on an annual basis in real terms. The main components of the revenue requirement are operating costs, capital maintenance and a return on capital.
- 5.1.2 Operating costs comprise the costs of operating the system as it stands in that year. This includes base service operating costs and net changes in operating costs associated with quality enhancements, service expansion and changes to the level of service.
- 5.1.3 Capital maintenance comprises the long-run cost of maintaining the asset systems. This is made up from the Infrastructure Renewals Charge (IRC) on below ground (infrastructure) assets and a depreciation charge³ for above ground (non-infrastructure) assets.
- 5.1.4 Return on capital is the return on the regulatory capital value (RCV). The RCV consists of an initial value *[to be determined and relies on a WWRO and/or government policy decision]* and subsequent capital expenditure net of depreciation and grants and contributions.
- 5.1.5 The rate of return on the RCV is determined on the basis of *[subject to WWRO and/or government policy decision]*.
- 5.1.6 For this first review there is no provision for incentive allowances to be retained for five years as there has been no prior incentive based tariff review for such incentive allowances to pass through from. Future five year reviews shall provide for the retention of savings due to operating and capital out-performance.

³ Strictly speaking the depreciation needs to be determined on a current cost accounting (CCA) basis. However, it is unlikely that regional water supply service providers will have their accounting records established to provide a comprehensive assessment of CC depreciation and a simple indexation approach may be more appropriate.

6. OPERATING COSTS

6.1 General

6.1.1 This chapter sets out the various components of the operating costs forecast for the review period. The determined operating costs shall be included in the revenue requirement and will be used to determine the allowed revenue in each year of the review period.

[The provisions relating to the business plan and how the forecasts are determined are not within the scope of these procedures]

6.1.2 Operating costs are classified into three categories. The value of operating costs that must be included in the revenue requirement and that will be used to determine the allowed revenue in each of the years of the review period (before any adjustments and corrections) is equal to the sum of the three values that correspond with the categories. The three categories are as follows:

1. Fixed-cost (meaning operating costs that are unrelated to the number of customers and unrelated to the volume of water)
2. Customer-number-related operating costs
3. Volume-related operating costs (referring to the volume of water)

6.1.3 Operating costs shall be determined net of non-core and/or non-tariff related activities, e.g. the costs of new connections which are assumed to be balanced by connection fee revenues.

6.1.4 All operational costs will be treated by the ex-ante method and shall be estimated in real (un-indexed) prices.

6.2 Fixed-cost operational costs

6.2.1 Fixed operational costs financed by grants and contributions shall not be added to the revenue requirement.

6.2.2 No adjustment will be made to the annual allowed revenue in subsequent review periods based on whether the regional water supply service providers' expenditures are greater or less than the amounts included in the revenue requirement except for:

1. To the extent that a regional water supply service provider does not carry out activities required by its own O&M manual, e.g. routine maintenance carried out less frequently than specified in the manual *[subject to verification by the technical auditor]*, at the next price review the WWRO may deduct the amount of the costs thereby saved by the regional water supply service providers (based on best estimates) from the revenue requirement for the review period following the next price review.
2. To the extent that the regional water supply service providers can generate real efficiency gains the benefits of such gains shall be retained for a period of five years. Such 'pass through' gains shall be added to subsequent review period revenue requirements.

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6.3 Customer-number-related operational costs

6.3.1 Customer number related operational costs include those costs that are driven by the number of customer connections, e.g. meter reading, billing and collection.

6.3.2 The customer number related operational costs shall be determined on the basis of existing financial records to determine a cost per customer. This shall then be extrapolated to the projected number of customers for each year in the review period.

6.3.3 The customer number related operational costs per customer shall be subject to adjustment to reflect expectations of improved efficiency in customer services activities resulting in improved utilisation of resources, e.g. quarterly meter reading, and improved technology. The efficiency expectations shall be subject to scrutiny by the WWRO resulting in an expectation of costs per customer to fall in real terms over time.

6.4 Volume-related operational costs

6.4.1 The volume related operational costs include

1. The costs of electricity used in treatment and pumping
2. The costs of chemicals used in treatment (including tertiary chlorine dosing)
3. The costs of raw water

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6.4.2 Notation:

V_t Variable costs per cubic meter of water sold and paid for, used for the revenue requirement for year t

Q_t Forecast quantity of water sold for year t

EL_t Forecast cost of electricity for pumping per cubic meter of water pumped, for year t

CH_t Forecast cost of chemicals per cubic meter of water treated for year t

RW_t Forecast raw water or abstraction charge per cubic meter of water purchased or abstracted for year t

Ψ A forecast or stipulated coefficient equal to:

$$\frac{\text{Quantity pumped, treated, or produced (as the case may be)}}{\text{Quantity sold (i.e. billed)}}$$

Ψ_{ELt} Relating to water pumped in year

Ψ_{CHt} Relating to water treated in year t

Ψ_{RWt} Relating to raw water purchased or produced (i.e. water entering the distribution system) in year t water treated in year t

CE_t Stipulated collection efficiency for year t, equal to:

$$\text{revenue collected} / \text{revenue billed}$$

6.4.3 V_t is determined as follows:

$$V_t = \frac{(EL_t \times \Psi_{ELt}) + (CH_t \times \Psi_{CHt}) + (RW_t \times \Psi_{RWt})}{CE_t}$$

6.4.4 The value $V_t \times Q_t$ is included in the revenue requirement for year t of the review period.

6.5 Information requirements

6.5.1 The principal information requirements for this component of the model include:

Ref	Item	Unit	Source	Remarks
	Fixed operational cost projections (unrelated to the number of customers of volume of water produced or sold), e.g. labour, overheads, routine maintenance etc.	EUR	Regional water supply service providers' financial records and business plans	Based upon existing costs + or – any expected deviations, e.g. salary uplifts etc. Ensure that costs related to non-core or alternatively financed activities, e.g. new connections are excluded. Identify and separate out any costs funded by grants or other sources.
	Customer related operational costs, e.g. meter reading, billing and collection.	EUR	the regional water supply service providers' financial records business plans	Based upon existing costs + or – any expected deviations, e.g. salary uplifts etc. Identify and separate out any costs funded by grants or other sources.

Ref	Item	Unit	Source	Remarks
	Volume related operational costs and projections	EUR	the regional water supply service providers' financial records business plans	To include the costs as set out in section 6.4, e.g. electricity, chemicals, raw water purchase etc. Identify and separate out any costs funded by grants or other sources.

7. CURRENT COST DEPRECIATION

7.1 General

- 7.1.1 The fixed assets of the regional water supply service providers are broadly divided into two categories - underground (or infrastructure) assets and surface (or non-infrastructure) assets. The underground assets are not depreciated but expenditure to maintain the serviceability to customers of the network is included in the infrastructure renewals charge (IRC).
- 7.1.2 The revenue requirement includes an element for the replacement cost of depreciable assets spread over the economic life of the asset. This is the current cost depreciation charge (CCD).

7.2 CCD on existing non-infrastructure assets

- 7.2.1 The conventional approach is that CCD on existing assets at the beginning of the base year is an input to the model.

[Determining the value of CCD on existing assets is likely to prove very problematic due to various factors including: not knowing what the real Modern Equivalent Asset (MEA) values are and the resulting CCD provisions, not knowing how such assets were financed, e.g. grants, loans or equity investment, not knowing what the impacts of any debt relief are intended to provide etc. Rather than undertake a detailed and comprehensive analysis of assets and depreciation provisions, the answer to which may be little more than educated guesswork an alternative approach is presented in these procedures as follows:]

Variant A

- 7.2.2 Consider depreciation as a 'return of capital'. In this case the financial obligations for the return of capital are effectively the repayment of long term debt obligations. An opening value of CCD can therefore be determined on the basis of a Net Present Value of a repayment stream of the existing (but not subsequent) debts. This could then be transposed to a smoothed (uniform or gradually rising or falling) level of CCD to be applied over a specified period, say 10 to 20 years.

Variant B

- 7.2.3 A variant of the above approach could be to input debt repayment into the revenue requirement on an annualised basis, i.e. no smoothing based upon NPV. This ensures sufficient cash flow to meet repayment obligations year on year. On this basis the CCD on existing non-infrastructure assets will decline over time as debts are progressively paid off. Similarly the RCV of the original asset base will also decline but the overall RCV will increase as new investments come on stream.
- 7.2.4 Using either of the above this component of the revenue requirement *is / is not [debateable see note at end of paragraph]* subject to inflation indexation. *[It can be argued that as the repayment obligations of loans in EUR remain constant irrespective of inflation there is no requirement to allow for inflation adjustments (although any repayment obligations in foreign currencies may still need to be indexed against exchange rate movements). It can be counter-argued that this component should, in fact, be subject to indexation as the repayment of loans is the employment of earned returns which should be protected against the adverse impacts of inflation. By allowing for this to be indexed the tariff calculation does become significantly simpler as there is no need to separate indexed from non-indexed elements of the RCV and CCD.]*

[It can be argued that a significant portion of the long term loans held by the water supply service providers may have been for investment in the infrastructure (underground) assets for which no depreciation should be charged and therefore an apportionment of debt between infrastructure and non-infrastructure assets is required. However, if this approach was adopted it would effectively demand that a portion of the allowance for infrastructure renewals would have to be spent on debt repayment and re-borrowing would be necessary to meet the level of renewals expected. It may be unlikely that the regional water supply service providers would be able to borrow for infrastructure renewals activities, at least not

in the short term, and it is therefore prudent to consider all debt repayment obligations to be substituted for CCD on existing assets.]

[Both of the above variants may be insufficient to meet the needs of the utilities in that their existing levels of debt are very low and using debt repayment as a surrogate for depreciation may result in insufficient finance for capital maintenance.]

Variant C

On the basis that the asset registers for the utilities may hold reasonably accurate information in their investment activities since year 2000 it may be prudent to set the opening level of current cost depreciation based upon only those non-infrastructure assets commissioned after this date.

7.3 CCD on new non-infrastructure assets

7.3.1 CCD on new investment is calculated on a straight line basis in accordance with their respective asset lives. Similarly grants and contributions on above ground assets are written off over the life of the asset.

[The financing of investment in Kosovo is sometimes through concessionary (soft) loans with very low interest rates and generous grace periods and repayment provisions. It is debatable as to whether the regional water supply service providers should be entitled to a full return on capital for investments financed on such terms. It is suggested that any projects financed by such concessionary loans are analysed and recalculated (for tariff setting purposes only) to a combination of grant and commercial loan equivalent whereby the difference between the value of the loan and the NPV of the loan repayment profile, including interest (discounted on a commercial lending rate) is, in effect, the value of the grant equivalent. On this basis the determined grant component is treated as any other grant according to these procedures.]

7.3.2 The proportions of capital investment in each asset life category are input separately for maintenance, quality enhancement, supply demand balance and enhanced service levels expenditure. The apportionment of grants and capital contributions received between the asset life categories are also inputs to the model.

7.3.3 If the service capability of a pool of non-infrastructure assets is in a steady state and the accounting life of the assets is equivalent to their service life, then in the long run the capital maintenance expenditure to renew and replace the asset base (maintenance non-infrastructure (MNI) expenditure) and the current cost depreciation charge for those assets should be comparable (concept of *Broad Equivalence*). The steady state condition for broad equivalence is not expected in the review period and the investment necessary to enhance and upgrade the non-infrastructure assets to the required service levels over a prolonged period will result in increasing levels of CCD over and above the allowance for CCD on the existing assets (determined on the basis of loan repayment obligations).

7.4 Information requirements

7.4.1 The principal information requirements for this component of the model include:

Ref	Item	Unit	Source	Remarks
	Existing long term debt obligations (repayment of principal profile)	EUR per year	Regional water supply service providers' financial records and business plans	Identify and separate repayment obligations in foreign currency.
	Capital maintenance plans for non-infrastructure assets.	EUR per year	the regional water supply service providers investment plans and business plan	Judgement required to determine whether investments are for CM or enhancement. Tariff impact is negligible (if any) and therefore accuracy in judgement is not too much of a concern. Identify and separate out any investment funded by grants or other sources.

Ref	Item	Unit	Source	Remarks
	Investment in non-infrastructure enhancement separated by activity, e.g. quality, I o s, expansion etc.	EUR per year	the regional water supply service providers financial records business plans	Identify and separate out any investment funded by grants or other sources.
	Asset useful lives	Years	the regional water supply service providers policy	WWRO to be satisfied that the asset lives used reflect real expectations of asset life.
	Investment financing details, e.g. interest etc.	Schedule	the regional water supply service providers investment plans	Policy decision required with respect to conversion of concessionary loans to grant and loan equivalents.

8. INFRASTRUCTURE RENEWALS CHARGE

8.1 Concept

8.1.1 Infrastructure renewals accounting is used for underground assets rather than conventional depreciation. An infrastructure renewals charge (IRC) is made each year and included in the revenue requirement. The IRC reflects the average of infrastructure renewals expenditure (IRE) over a period of time.

8.1.2 The IRC is determined on the basis of the expenditure necessary to maintain base levels of service and excludes expenditure on infrastructure enhancement which is added to the RCV. Infrastructure enhancement includes the expenditure made to improve water quality, levels of service and meeting supply / demand balance (including service expansion).

[It is recognised that there may be a significant backlog of infrastructure renewals that is required to raise quality and levels of service to the required levels. It is unlikely that the proposed infrastructure renewals programme will be able to clearly identify the breakdown in order to separate backlog from that required to maintain the current low levels of service. A degree of regulatory discretion is required in this instance to determine an estimate of the amounts to be financed by the IRC and that to be added to the RCV. Furthermore, it becomes more complicated in that the IRC would need to be increased progressively in order to deliver improving levels of service. A simple, albeit crude, methodology is to estimate the IRC necessary to maintain the existing low level of service and that required to meet the ultimate level of service and progressively increase the IRC on a straight line basis over the period by which the ultimate level of service is achieved. The balance of the spend on infrastructure can effectively be added to the RCV. This problem is simplified where infrastructure investment is financed through grants as, in accordance with the IRC concept, grant financed expenditure on infrastructure (renewals and enhancement) is neither added to the RCV nor included in the IRC.]

8.1.3 Capital grants and contributions attributable to infrastructure renewals are not included in the revenue requirement.

[If concessionary loans are employed the grant equivalent component should not be added to the revenue requirement.]

8.2 Information requirements

8.2.1 The principal information requirements for this component of the model include:

Ref	Item	Unit	Source	Remarks
	Infrastructure renewals expenditure programme	EUR per year	Regional water supply service providers' business plans	Judgement required to separate normal renewals from backlog, the latter to be considered as service enhancement and to be added to the regulatory capital value. Identify and separate out any costs funded by grants or other sources.
	Increased demand projections	Schedule	Regional water supply service providers' investment plans	Policy decision required with respect to conversion of concessionary loans to grant and loan equivalents.

9. INFRASTRUCTURE CHARGES AND CONTRIBUTIONS

9.1 Infrastructure charges

- 9.1.1 Infrastructure charges are paid by developers and customers in new properties for either a first-time connection of premises for domestic purposes to a public water supply or a public sewer. The charge is to cover the cost of improving the distribution network to meet the demand created by the connection of new premises over time.
- 9.1.2 Infrastructure charges shall be confined to the costs of enhancing the network, including pumping stations and storage facilities but not including water source works and water treatment facilities.
- 9.1.3 The infrastructure charges shall be determined on the basis of the long run marginal costs of new investment per dwelling with a discount rate set at the same rate as the regulatory return on capital.
- 9.1.4 The model for determining the infrastructure charges shall be for a minimum of 15 years but longer run models shall be developed where appropriate.
- 9.1.5 The regulatory capital value shall be the cost of the investment net of infrastructure charges.
- 9.1.6 Without detailed investment plans the utilities shall employ an estimated value of infrastructure charges to be determined by the WWRO, the value of which shall not be added to the regulatory capital value.

9.2 Capital contributions

- 9.2.1 Capital contributions are paid by developers and customers for the development of infrastructure specific to the needs of the developer or customer, e.g. a new pipeline to a factory, and to cover the cost of improving the distribution network to meet the additional demand.
- 9.2.2 As for infrastructure charges the capital contributions shall be confined to the costs of any dedicated infrastructure and enhancement of the network, including pumping stations and storage facilities but not including water source works and water treatment facilities. *[There is an argument in favour of a contribution towards new treatment facilities and water source works when the expected increase in demand is high. This should be examined further].*
- 9.2.3 The capital contributions shall be determined based upon the real costs of meeting the additional demand or determined on the basis of the long run marginal costs of new investment per m³ of water expected to be supplied with a discount rate set at the same rate as the regulatory return on capital whichever is most appropriate⁴.
- 9.2.4 The regulatory capital value shall be the cost of the investment net of any contributions.

9.3 Information requirements

- 9.3.1 The principal information requirements for this component of the model include:

⁴ Where new investment is specific to an individual customer or developer the determination of the capital contribution is straightforward. Where an investment is made to cater for several potential customers or developers at different times or shared with existing customers a more complex discounted cash flow approach is needed to determine the relative apportionments of the contributions.

Ref	Item	Unit	Source	Remarks
	Infrastructure expenditure to meet supply demand balance	EUR per year	Regional water supply service providers' investment plans	To be separated to identify that required to satisfy increased domestic demand attributable to new connections, i.e. excluding increased demand due to rising per capita consumption, and that required to meet increase demand attributable to specific developers / customers for the determination of capital contributions. Investment schedule to separate infrastructure from non-infrastructure activities.
	Projected new connections (domestic and small commercial)	Schedule	Regional water supply service providers' business plans	Annualised programme necessary for the determination of long run marginal costs.
	Infrastructure expenditure to meet specific customer needs for capital contributions	EUR per year	Regional water supply service providers' investment plans	For investments required for more than one developer / customer the expenditure needs to be broken down on an annualised basis for the determination of long run marginal costs.
	Projected increased water demand	Schedule	Regional water supply service providers' business plans	To clearly separate increased demand attributable to new connections, i.e. excluding increased demand due to rising per capita consumption, and that required to meet increase demand attributable to specific developers / customers for the determination of capital contributions.

10. REGULATORY CAPITAL VALUE

10.1 Concept

- 10.1.1 The regulatory capital value (RCV) represents the capital base upon which the regional water supply service providers are entitled to a return. It represents the level of investment made in the regional water supply service providers by investors and lenders (equity and debt).
- 10.1.2 The opening value of the RCV in the base year is an input to the financial model.
- 10.1.3 Capital expenditure to enhance and maintain the network is added to the RCV. Any capital grants or contributions towards the cost of the new assets are deducted. Current cost depreciation is deducted from the RCV each year.
- 10.1.4 Infrastructure renewals expenditure (IRE) is not added to the RCV.

10.2 Opening regulatory capital value

[The opening regulatory capital value is a major issue requiring a policy decision from both government and the WWRO. The principal positions for the government and the WWRO to decide upon include: the value the municipal equity (related to which is the municipalities' expected return on equity), provisions for working capital, and the treatment of debt. There are several variants to consider as follows:]

Variant A

- 10.2.1 The RCV of the each regional water supply service providers is the value of long term debt⁵ plus an allowance for working capital. The debt component of RCV shall not be subject to indexation at the periodic review as the level of debt does not change with inflation. Adjustments to the RCV shall be made to reflect exchange rate fluctuations on debts held in foreign currency. The repayment of debt shall result in a fall in the RCV but shall be compensated with subsequent investment in infrastructure enhancement and non-infrastructure assets. *[Alternatively, the RCV can be subject to indexation reflecting the employment of capital irrespective of whether it is used to repay loans or undertake further investment. This alternative approach delivers a slightly higher tariff but the calculation process becomes significantly simpler].*

[The principal advantage with this option is that it delivers the lowest tariff but it will progressively rise as new investments are made resulting in increased returns on capital and CCD. The disadvantage is that the municipalities are effectively valuing their equity stake as zero.]

Variant B

- 10.2.2 The RCV of the regional water supply service providers is the value of long term debt plus a nominal amount of municipal equity *[to be determined]* plus an allowance for working capital. The value of municipal equity and working capital shall be subject to indexation at the periodic review. *[see above, all RCV could be subject to indexation.]*

[This option delivers a higher tariff that includes a return on municipal equity. The regulatory value of municipal equity can be determined arbitrarily and does not need to reflect asset valuation.]

Variant C

- 10.2.3 The RCV of the regional water supply service providers is the net current cost value of the assets of the regional water supply service providers including working capital. The total RCV shall be subject to indexation at periodic reviews.

⁵ The value of debt may be adjusted to reflect the impact of concessionary loans, i.e. to convert the current level of debt to a grant and commercial loan equivalent and only the latter is treated as RCV.

[This option delivers the highest tariff. It is questionable as to whether such an option is appropriate when many assets may have been gifted, or financed by grants and concessionary loans. It may result in excessive positive cash flows to the regional water supply service providers and may not promote financial and economic efficiency. This variant is not recommended]

- 10.2.4 The provision for initial working capital shall reflect the finances necessary for the day-to-day activities of the regional water supply service providers (and may exclude the accounts receivable). The value of working capital within the RCV shall be subject to indexation at the periodic review. *[The level of initial working capital could be made arbitrarily, e.g. 3 months turnover].*
- 10.2.5 No future adjustments to working capital other than through indexation of total RCV shall be made.

10.3 Information requirements

- 10.3.1 The principal information requirements for this component of the model include:

Ref	Item	Unit	Source	Remarks
	Opening regulatory capital value including working capital.	EUR	Regional water supply service providers' financial records and government policy	Government / regulatory policy decision required with respect to municipal equity. Policy decision required to determine opening working capital requirement.
	Backlog infrastructure renewals and infrastructure enhancement programme	EUR per year	Regional water supply service providers' financial records and business plans	Identify and separate out any costs funded by grants or other sources.
	Non-infrastructure CM and enhancement programme	EUR per year	Regional water supply service providers' financial records business plans	Identify and separate out any costs funded by grants or other sources.
	Investment financing details, e.g. interest etc.	Schedule	Regional water supply service providers' investment plans	Policy decision required with respect to conversion of concessionary loans to grant and loan equivalents.

11. RETURN ON CAPITAL

11.1 Concept

11.1.1 The return on RCV is the real return, i.e. adjusted for inflation.

[As with the determination of the value of RCV the return on capital is a matter for debate and government policy. Should the regional water supply service providers earn a return equivalent to commercial returns for similar risk businesses in Kosovo or elsewhere, recognising that it is a state-owned enterprise? Should the return on capital be set on the basis of existing debt obligations? Should the return on capital be set according to a government determined interest rate, etc.? Recognising that the options for determining the level of the RCV may, in fact, result in quite a low RCV relative to overall assets the impact that the return on RCV may have on the tariff may be minimal, at least in the early years. However, on the basis that future concessionary loans may be converted to an equivalent NPV combination of grants and commercial loans the return on RCV should at least be comparable to commercial borrowing rates. Extending this argument further, the government's desire for greater private sector investment in the sector will demand returns on RCV (at least that element financed by the private sector) to be comparable with the expectations of similar risk returns. It may be unrealistic, however, in the very short term to set the return on RCV to suit private sector expectations until there is a firm commitment to attract private sector financing. Consequently, these procedures present several variants for setting the return on RCV as follows:]

Variant A

11.1.2 Set the return on RCV to reflect the commercial cost of borrowing (net of inflation) for an organisation such as a regional water supply service provider plus *[optional]* a small premium *[to be determined]* to reflect equity expectations of returns.

[This is the simplest approach and aside from the small premium it is easily justifiable. However, it may not satisfy the expectations of future private sector investment.]

Variant B

11.1.3 Set the return on RCV on the basis of a weighted average cost of capital (WACC) where the debt component reflects the interest payable on the initial RCV debt whereas the equity element reflects the return on any additional RCV (irrespective of whether the financing is through borrowing or equity) at a commercial rate of return (net of inflation).

[The net result of this variant is an increasing return on capital as the ratio of initial RCV to new RCV changes with new investment although it may be possible to determine an average equivalent. The calculation of the return on RCV does, however, become complex.]

Variant C

11.1.4 Set the return on RCV using the Capital Asset Pricing Model (CAPM) whereby the return is the sum of the 'risk-free' real interest rate plus the industry risk premium. *[It is recognised that the market information in Kosovo is not sophisticated enough to facilitate a detailed CAPM analysis. As an alternative it may be possible to employ the results of the OFWAT tariff determinations in England / Wales, i.e. use the risk premium determined by OFWAT for the water industry. This may not necessarily be a true reflection of Kosovo water industry risk (excluding country political risk) but may be considered to be an acceptable surrogate.]*

11.1.5 The 'risk-free' real interest rate can be based upon Euro-zone government treasury bonds (adjusted for inflation). *[This variant is effectively sets the scene for attracting private investment in the sector whereby the returns on offer for new investment are comparable to private sector expectations. The only missing element is a provision for country risk without which external investment may not be forthcoming. Many governments in the Euro-zone issue treasury bonds which can provide an appropriate measure of risk free return. Country risk in within the Euro-zone is reflected by the variance in the rates – although the degree of variance is generally quite small. As Kosovo is not in the Euro-zone the country risk may be higher than the highest within the zone. WWRO should consult with the Kosovo central bank to determine an appropriate level of country risk premium.]*

11.2 Information requirements

11.2.1 The principal information requirements (depending upon which variant is selected) for this component of the model include:

Ref	Item	Unit	Source	Remarks
	Risk free real returns	Rate	Euro-zone government treasury bond yields adjusted for inflation and Kosovo country risk	This depends upon the degree of sophistication in the market for government bonds and the measurement of yields. It may include country risk but not necessarily investor perceptions of country risk.
	Industry risk premium	Rate	OFWAT determinations (or other suitable surrogate)	The use of the OFWAT data is possibly the only viable alternative although the industry risk premium for the regional water supply service providers may be perceived as being considerably higher than that determined by OFWAT for England/Wales.
	Actual cost of debt	Rate	Regional water supply service providers' financial records	Applicable to embedded debt only and excludes new financial obligations.

11.2.2 In all cases policy decisions are required to determine the most appropriate return on regulatory capital value.

12. TARIFF CALCULATION

12.1 Concept

- 12.1.1 Tariffs per m³ of water are determined on the basis of the sum of operational and capital maintenance costs and the return on regulatory capital divided by the expectations of the volumes of water sold and paid for.
- 12.1.2 Tariffs can be set on the basis of either smoothed or unsmoothed tariffs.
- 12.1.3 For the unsmoothed option the resulting tariffs are determined on a year on year basis expressed in real terms. This will result in annual increases or decreases in the tariff in real terms (K factors). The resulting unsmoothed tariffs will be adjusted annually by the rate of inflation as determined by the retail price index (RPI) plus a factor K.
- 12.1.4 For the smoothed tariffs a uniform (constant) K value is determined that delivers the same NPV that of the unsmoothed tariffs. For this there are several variants available. It is not appropriate to state in these procedures the precise method to be adopted but rather to undertake the analysis on an unsmoothed basis and then examine the implications of smoothing first before reaching a decision. Regardless of what smoothing option is adopted the calculation must deliver the same NPV as the unsmoothed option.

Variant A

- 12.1.5 The tariff is determined with a K value of zero, i.e. the resulting tariff for the review period is uniform in real terms throughout the period and is only allowed to increase by the rate of inflation.

Variant B

- 12.1.6 The tariff is determined with a uniform K starting from the current existing tariff prior to the review, i.e. the tariff increases (or decreases) annually including the initial adjustment are uniform in percentage terms. This avoids the possibility of a first year tariff shock. However, this may result in cash flow shortages for the regional water supply service providers in the early years if the existing tariff is substantially below that determined on an unsmoothed basis. *[It is questionable as to whether the regional water supply service providers enjoy sufficient lines of credit to facilitate such short term cash flow requirements and if not the regional water supply service providers may not be able to meet its planned programme of capital maintenance]*

Variant C

- 12.1.7 The tariff is determined on the basis of the year 1 tariff set at the unsmoothed level for year 1 with a uniform K for the following two yearly adjustments. This may result in a first year price shock (followed by uniform adjustments) but protects the regional water supply service providers against adverse cash flow shortfalls.

12.2 Unsmoothed tariff and calculation of individual year K factors

- 12.2.1 The resulting average tariff (T_{ave}) for each year (t) is calculated as:

$$T_{ave(t)} = \frac{\text{Operating expenditure}_{(t)} + \text{Capital Maintenance}_{(t)} + \text{Return on RCV}_{(t)}}{\text{Quantity of water sold}_{(t)} \times \text{Collection efficiency}_{(t)}}$$

Where:

Operating expenditure =

Fixed-costs + customer number related costs + volume related operational costs

Capital Maintenance =

IRC + CCD (existing non-inf. assets) + CCD (new non-inf. assets)

Return on RCV = Rate of return on RCV x RCV

Quantity of water sold = Total volume (m³) billed for each year, and

Collection efficiency =

(billed amounts – non-recoverable billings) received / billed amounts

- 12.2.2 If the relative prices (ratios) for the various tariff categories are to change over the review period it is necessary to determine the individual tariff for each category.
- 12.2.3 For the determination of individual category tariffs the above formula is applied but the quantity of water sold is adjusted to the domestic equivalent tariff (T_D) and the collection efficiency is determined on the basis of weighted collection efficiency for each category. The subsequent tariff categories are determined by multiplying the determined domestic equivalent rate by the respective ratios, i.e.

$$T_{D(t)} = \frac{\text{Operating expenditure}_{(t)} + \text{Capital Maintenance}_{(t)} + \text{Return on RCV}_{(t)}}{[Q_{D(t)} \times CE_{D(t)}] + \sum \text{Weighting}_{X(t)} \times (Q_{X(t)} \times CE_{X(t)})}$$

Where:

Q_D = Volume of water sold at the domestic rate,

CE_D = Collection efficiency of domestic sales

Weighting_X = Tariff for customer category X / Domestic tariff

Q_X = Volume of water sold to customer category X

CE_X = Collection efficiency for customer category X

- 12.2.4 The resulting tariffs, average and by category, are broken down into their constituent components of operating costs, capital maintenance return on capital expressed as EUR per m^3 for illustrative and analysis purposes.
- 12.2.5 The result for each year will identify the opening (year 1) tariff and the real percentage increase or decrease for subsequent years, known as the K values, calculated as:

$$K_t = [\text{Un-indexed Tariff}_t / \text{Un-indexed tariff}_{t-1}] - 1$$

Where:

K_t = K factor for year t

- 12.2.6 Where the ratios of the various category tariffs change over the review period it shall be necessary to determine individual un-indexed prices and an individual K factor for each tariff component, e.g. if the policy was to close the gap between the domestic and the non-domestic tariffs the K factor for the domestic tariff will be greater than the K factor for the non-domestic tariff.

12.3 Smoothing

- 12.3.1 The smoothing calculation will depend upon which variant is selected.
- 12.3.2 The basis of the calculation is to determine a uniform K factor for the review period that will delivers a Net Present Value (NPV) of the total income stream equal to the NPV of the unsmoothed income stream.
- 12.3.3 The discount rate to use is the determined return on regulatory capital value.

[The calculation methodology for this is relatively simple. The revenue stream of the unsmoothed income is equal to revenue requirement, therefore the NPV of the revenue stream less the revenue requirement is zero. First set the year one tariff and an arbitrary value of K which then sets the following year tariffs and determine the net revenue stream based upon sales for each year multiplied by their respective tariffs less the revenue requirement. Using the MS Excel 'goalseek' function determine the value of K that results in

an overall net NPV equal to zero. In the case of setting K to zero use 'goalseek' to determine opening (constant) value of the tariff⁶]

12.4 Financial statements and indicators

- 12.4.1 The outcomes of the unsmoothed and smoothed tariff analyses shall determine pre-indexation forecast financial statements: income (profit loss), balance sheet and cash flow.
- 12.4.2 The accounting statements should reflect the regulatory accounting guidelines, notably regulatory capital value.
- 12.4.3 The cash flow statement is the principal financial statement. It is necessary to ensure that the regional water supply service providers operate at or near positive cash flows recognising its limited ability to obtain short term financing of negative shortfalls.

⁶ For a uniform constant tariff an alternative method is to divide the NPV of the revenue requirement by the NPV of the volume of sales.

13. INDEXATION

13.1 Concept

- 13.1.1 All costs determined in these procedures are set at mid-year price level of the year preceding the commencement of the tariff review period.
- 13.1.2 The opening tariff shall be set on the basis mid-year price level of the year preceding the commencement of the tariff review period 2008 price basis multiplied by the inflation index for that year.
- 13.1.3 Subsequent tariffs shall be adjusted by the preceding year inflation figures, i.e. 200X tariff adjusted by inflation index for the year (200X – 1).
- 13.1.4 Tariffs shall be allowed to accommodate the impacts of inflation based upon an overall retail price index, or, if considered appropriate, broken down into constituent inflation components.

[It is not recommended to break the tariff component down into many different components. At the most it is recommended to break the tariff into three elements: that component (if any) that should not be subject to indexation; the energy component and the non-energy component (on the basis that energy can be considered to be a special item, the level of consumption in the water sector quite possibly being greater than that reflected on the overall retail price inflation statistics). Furthermore, breaking the tariff down into different components presents an added complication in that the proportion of the tariff for each component will not be constant and annual adjustments to the proportions will be necessary, e.g. if the price of energy rises by more than the rate of general inflation then its proportion of overall costs will increase]

13.2 Method

- 13.2.1 For the first year (200X) the determined initial tariff at mid 200X-1 prices is multiplied by rate of inflation between 1 Jan and 31 Dec 200X-1 to arrive at a mid-200X price base⁷
- 13.2.2 The unsmoothed tariff shall be set at the Year 1 tariff and shall be adjusted annually as:

$$\text{Tariff}_t = \text{Tariff}_{t-1} \times (1 + \text{RPI}_{t-1}) \times (1 + K_t)$$

Where:

RPI_t = retail price index for year t

K_t = [Un-indexed Tariff_t/ Un-indexed tariff_{t-1}] - 1

Example:

Calculated un-indexed (mid 200X prices) tariffs:

200X+1 = EUR 0.60, and
200X+2 = EUR 0.65

Inflation rates:

200X = 7%, and
200X+1 = 8%

Calculation:

$$\text{Tariff}_{200X+1} = 0.60 \times (1 + 7\%) = \text{EUR } 0.642$$

$$K_{200X+2} = 0.65/0.60 - 1 = 8.33\%$$

$$\text{Tariff}_{2010} = 0.642 \times (1 + 8\%) \times (1 + 8.33\%) = \text{EUR } 0.751$$

- 13.2.3 If the procedures adopt any of the variants that exclude parts of the tariff from indexation then the above formula should be adjusted accordingly. Similarly, if elements of the tariff are required to be indexed separately, e.g. the energy cost component, the remaining elements

⁷ Inflation indices for the previous 12 months are used on the basis of the best historical information

of the tariff shall be indexed by the general inflation index that excludes the specific indexation elements, e.g. all items excluding energy. Not doing so will result in double counting of inflation components.

13.3 Future tariff reviews and regulatory capital value

- 13.3.1 The indexation process effectively provides a post inflation return on the regulatory capital value. This return is equivalent to the real rate of return multiplied by an indexed regulatory capital value. No adjustment to the regulatory capital value within the review period is necessary.
- 13.3.2 For future review periods the regulatory capital value shall to be adjusted for inflation, e.g. to mid-2011 prices for the determination of tariffs for the 2012 – 2014 period.
- 13.3.3 The opening regulatory capital value is indexed by inflation over the whole review period less the amounts deducted (CC depreciation or equivalent) indexed from the time that the deductions were made. Any other additions or deductions against the regulatory capital value shall be indexed from the time they were incurred.