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This report presents a set of concrete tools that can be used to quantify households' affordability and willingness to pay for water and wastewater services. The tools are intended for use in the preparation of major investments in the water and wastewater sector. The report includes tools for both public - private partnerships and traditional investment projects.

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Water Prices in CEE and CIS Countries Volume I: Main Text

Ministry of the Environment

DANCEE

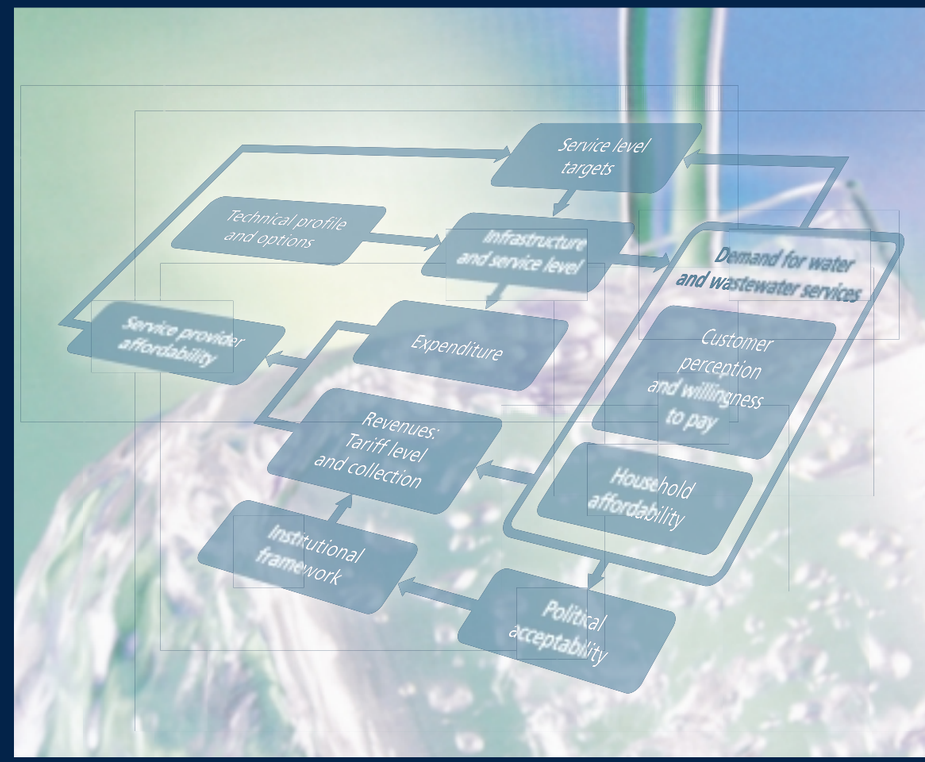
Ministry of the Environment

Water Prices in CEE and CIS Countries

THEMATIC REPORT

A Toolkit for Assessing Willingness to Pay, Affordability and Political Acceptability

Volume I: Main Text
March 2002



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Abstract
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Terms
Stated preference, water and wastewater, affordability, willingness-to-pay, political acceptability

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Water Prices in CEE and CIS Countries

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ABBREVIATIONS AND ACRONYMS

BOT	Build, operate, transfer
BVK	Brno Water and Wastewater Utility
CEE	Central and Eastern Europe
CIS	Commonwealth of Independent States
DANCEE	Danish Co-operation for Environment in Eastern Europe
DEPA	Danish Environmental Protection Agency
EBRD	European Bank for Reconstruction and Development
EU	European Union
GDP	Gross domestic product
IFC	International Finance Corporation (World Bank group)
IFI	International Financial Institution
ISPA	Instrument for Structural Policies for Pre-accession
O&M	Operation and Maintenance
PLN	Polish Zloty
PPP	Public-private partnership
PR	Public relations
PWIK	Poznan Water and Wastewater Utility
RP	Revealed preference
SP	Stated preference
UAH	Ukrainian Hrivna
UfW	Un-accounted for water
WB	The World Bank
WTP	Willingness to pay

The following currencies and conversion rates have been used in the report

1 CZK = 0.20 DKK as of October 1999 equivalent to
1 EUR = 36.75 CZK as of October 1999
1 PLN = 1.80 DKK as of November 1999 equivalent to
1 EUR = 4.14 PLN as of November 1999
1 RUR = 0.28 DKK as of November 1999 equivalent to
1 EUR = 26.58 RUR as of November 1999
1 UAH = 2.13 DKK as of average 1998 equivalent to
1 EUR = 3.50 UAH (then UAG) as of average 1998

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The research and field work for this toolkit was carried out under a contract with the Danish Ministry of the Environment, Danish Environmental Protection Agency (DEPA) in response to a request by the EBRD. The toolkit was prepared by a core team consisting of Michael Jacobsen (team leader), Mikkel Birkeland, Peter Christensen, Arne Kvist Rønnest and Karsten Vesth-Hansen (all COWI), Zsuzsanna Lehoczki (COWI Hungary), Alexander Martussevich (COWIconsult International, Moscow) and Chris Heywood (Accent Marketing & Research).

Comments and contributions were provided by a number of people. Ulla Blatt Bendtsen (DEPA), Glen Anderson (Consultant to DEPA), Ole Sinkjær (Consultant to DEPA), Chris Shugart (EBRD), Vagn Rehøj (COWI) and many others who provided helpful comments. Contributions to the case studies were provided by Ankieter (Poznan, Poland); Ladislav Tuhovcak (Technical University of Brno), COWI Moscow and local consultants in Kaliningrad. Material for the desk studies was provided by Carl Bro Management (Borovichi, Russia), Milieu Ltd and APPC (Ukmerge, Lithuania), Rambøll and Eestivärki (Small Towns, Estonia) and COWI (Lviv and Sevastopol, the Ukraine).

FOREWORD BY THE DANISH ENVIRONMENTAL PROTECTION AGENCY (DEPA)

by **Karsten Skov,**
Deputy Director General, Danish Environmental Protection Agency
and
Ulla Blatt Bendtsen,
Project Co-ordinator, Danish Environmental Protection Agency

Although large achievements have been made over the past 10 years to improve the water supply and wastewater treatment systems in Eastern Europe, these countries still face large investments in water infrastructure in order to meet international standards. Meeting EU water legislation is among the most difficult and expensive challenges facing the 10 Eastern European accession countries in the first decade of the 21st century. Implementing urban wastewater treatment requirements alone is estimated to cost more than 15 billion EURO. Other demanding water acts include the Drinking Water Directive, the Bathing Water Directive and the Nitrate Directive a.o.

In the CIS meeting international standards is even more costly as water systems have seriously deteriorated over the past 10 years due to lack of maintenance and rehabilitation. The present service level is generally low and in many cases peoples' health is at risk.

At the same time public budgets are squeezed and local water companies are required to cover costs fully through increased tariffs from their customers. Hence, tariffs are likely to rise dramatically, and in some cases this could be impossible or unacceptable. Therefore, there is a strong need to prepare surveys of consumers' willingness and ability to pay for improved services as part of the investment planning.

On this background the Danish EPA has financed the preparation of this new Toolkit to assess the acceptability of increased water prices in the CEE and CIS countries. The work is based on a number of concrete case studies and has been developed in close co-operation with the EBRD. The Danish Consultant COWI was commissioned for the work.

The tool is relevant for both larger and smaller cities (a reduced survey is recommended for smaller towns) and in cases of both public and private funding of the municipal investment project. Although it was developed for Eastern Europe, the methodology may also be applied to water investments in developing countries.

We are pleased that, with this toolkit, we have a well structured manual for conducting household demand analysis at three different levels: Willingness to pay, affordability and political acceptability which combined with the technical baseline study forms a good foundation for any decision to invest in new water infrastructure as well as any discussion on possible compensation schemes for those households that may not be able to pay for the increase in service levels. It is our hope that the toolkit will find wide applicability among many different user groups (municipal investment planners, sponsors, international financing institutions, consultants, etc.) and we would like to thank the many stakeholders who have provided valuable information for the project.

FOREWORD BY THE EUROPEAN BANK FOR RECONSTRUCTION AND DEVELOPMENT (EBRD)

by **Thomas Maier**
Director, Municipal and Environmental Infrastructure, European Bank for Reconstruction and Development
and
Chris Shugart
Senior Banker, European Bank for Reconstruction and Development

Based on experience gained in lending to projects in central and eastern Europe, the Municipal and Environmental Infrastructure team of the European Bank for Reconstruction and Development (EBRD) proposed to the Danish Environmental Protection Agency (DEPA) the idea of preparing a toolkit that would gather together best-practice techniques for assessing the social and political acceptability of urban water and wastewater tariffs.

Of special importance in the regional context are the substantial increases in residential tariffs often encountered during the first few years of project implementation, which are needed for the following reasons:

- Many years of past neglect and deterioration of assets call for a high level of catch-up investments.
- Increasingly stringent wastewater standards lead to large investments in treatment plants.
- Macroeconomic adjustment has led to tight budgetary constraints reducing the availability of subsidies from central and local governments.
- Cost-reflective tariffs are being promoted to increase economic efficiency.
- Re-balancing of tariffs is encouraged to eliminate or reduce cross-subsidies from business to residential users.

The EBRD's particular concern in its role as a lender is with risk assessment: whether such increases will be socially and politically acceptable and how this will affect the financial feasibility of projects. The issue is highlighted when the EBRD lends to water utility companies without the benefit of either a sovereign or municipal debt guarantee – notably in the case of many concessions and BOTs. In these cases, the credit strength of the deal depends critically on whether tariff levels are sustainable.

Needed is a set of practical tools that gives a comprehensive and confident assessment of the risk of non-payment, social dissatisfaction or political unwillingness to respect the tariff provisions in the loan agreement or concession contract – as well as the risk that the project will never even reach signing.

Willingness to pay and affordability studies yield important information for this purpose:

- Willingness to pay (i.e. for service improvement or to avoid future service deterioration) is part of the picture: if consumers consider that they are getting value for money from a tariff increase, any annoyance they may feel at having to pay higher bills should be short-lived (all other things being equal).
- Affordability (ability to pay) is another important aspect: if, for a given tariff level for water and wastewater, consumers are not able to satisfy basic needs for all essential goods and services, there might be considerable resistance to accept a tariff increase to that level.

But these approaches do not tell the whole story. There are other factors that enter into the final outcome: broadly speaking, they can be characterised as relating to perceived fairness and equality of treatment.

A key issue is whether consumers view a price increase as technically and financially justified – and inescapable – or whether they perceive it as being the result of factors such as the following:

- inefficiency, waste or poor planning on the part of the water company (i.e. do consumers trust their water company?);
- gains to politicians who are viewed to be corrupt;
- "excessive" profits being taken out by private investors.

Another aspect is whether consumers feel discriminated against if the tariffs in many other cities in the country are lower.

Also important is the extent to which negative attitudes among the population – whether well-founded or not – are fuelled by politicians or organised interest groups. Typically, local utility prices are highly politicised, with politicians' attitudes often swinging to and fro in response to national party positions and local election strategy. Finally, resistance to tariff increases is often expressed in concrete terms through local political decisions, and so analysis that focuses directly on political acceptability is essential.

The methods contained in the toolkit broaden the scope of concern to include factors such as these. In addition, the toolkit attempts to improve on the two conventional approaches. For willingness to pay, the toolkit makes use of conjoint analysis, a type of stated preference methodology widely used in marketing and transport studies but not yet common in water and sanitation. With respect to affordability, the toolkit suggests ways to go beyond the conventional rule of thumb according to which water and wastewater expenditures are deemed affordable if they do not exceed 3–5% of disposable household income.

By putting the toolkit on the DEPA and EBRD websites and thereby making it available to a wide audience, we hope that it will serve as a resource to decision-makers and practitioners to help them in the following endeavours:

- setting appropriate performance standards (levels of service) that reflect consumer preferences, and realistic timetables for increasing these standards;
- providing better information to city officials, banks and private investors about the sustainability of tariffs and the financial feasibility of projects;
- encouraging the use of transparent competitive bidding procedures and public participation in the planning of concessions as a way to increase the perceived fairness of prices and hence to reduce the risk of consumer resistance;
- providing better ways of assessing whether the criteria for grants accorded by bilateral and multilateral agencies (e.g. the EU ISPA programme) are met;
- providing information for the design of tariff structures and, if desired, targeted subsidies;
- helping the water company plan a customer information campaign to reduce misperceptions and create trust.

In line with its purposes, the toolkit consists of a flexible, practical, and eclectic bag of survey and analytical techniques. The user, however, should be forewarned: there is no single magic number that emerges mechanically at the end of the process. The final step is to interpret and synthesise the results of the various surveys, and for this there is no substitute for sound social and political judgement, developed through solid experience.

Users will be the best judges of the extent to which the objectives set out for this toolkit have been achieved. We welcome all constructive feedback.

CHAPTER 1

RATIONALE AND APPROACH OF THE TOOLKIT

1.1 Background

The Danish Ministry of the Environment, DEPA, DANCEE and the European Bank for Reconstruction and Development, EBRD, initiated the work on this toolkit. The purpose is to make an operational toolkit to be applied in CEE and CIS countries, where investments in water and wastewater services are considered. With some modifications, the tool would also be applicable for use in water services for urban agglomerations in developing countries.

Large cities and small towns in the CEE and CIS countries presently face significant investments in water and wastewater services. The population wishes to have clean, potable water in their taps, and there is growing awareness on environmental issues, hence also of wastewater treatment. In addition, some CEE countries are upgrading the water services in order to meet EU standards.

The water and wastewater services provided should correspond to the preferences of the users and, therefore, detailed demand analysis is important when deciding upon the levels of investments. The toolkit provides a set of tools to assess the present and future demand for water and wastewater services, the willingness of the consumers to pay for these services and the political acceptability of the consumer charges. The resulting assessment is imperative for both policy makers and private investors, in order for them to choose the appropriate level and type of investment.

The tools are intended for use by the project sponsor (i.e. public administration, investor or daily operator), possible donors and international financial intermediaries, other lenders and their advisors / consultants. Specialists familiar with technical, economic, market research and policy analysis can use the toolkit when they need systematic methods to assess the consumers' willingness to pay, and the affordability and political acceptability of water prices in the context of investments in water services infrastructure in the CEE and CIS countries.

When specialists have applied the tools provided, a generalist with sound judgement and knowledge of the sector and the specific country/region should summarise the analyses into one overall assessment on risk and possible ways to mitigate the risk identified. This summary should be aimed at high level policy makers within the involved institutions.

1.2 Why?

Improved policies and projects through better assessment of the demand for services!

Thirty years back, even major infrastructure investments were often decided on the basis of detailed and systematic engineering analyses, but without much analysis of the prospective demand for the service. Today, an investor will not commit to a major infrastructure project investment until detailed studies of the future demand have been carried out.

Within the water services sector, the requirement for detailed demand analysis is now gaining ground. It is a mistake to assume that households always want lower prices for water and wastewater services. Households often want better services and are willing to pay for them. Detailed demand assessment studies can help inform policy-makers about this willingness to pay and the consequent scope for cost recovery and sustainability.

1 For example: The World Bank recommends stated preference analyses of customers' perceptions and willingness to pay (see CHAPTER 4) whenever financing a transport infrastructure project. There is not (yet) a similar formal recommendation for water and sanitation projects. The Inter American Development Bank requires the use of stated preference analysis for water and sanitation projects on routine basis.

2 This is the situation in the CEE and CIS countries today, but a quite similar situation was seen in the UK in the nineteen-eighties.

This is important because of the nature of the revenue risks in water services. Consumers may reduce their demand for water or chose not to pay their water bills, and the political system may regulate tariffs and enforcement of payment to the detriment of the water services provider. This toolkit is intended to guide policy makers and project sponsors to make choices that are sustainable and take account of the views of consumers.

1.3 When?

At the preparatory stages of investment projects and / or decision regarding public-private partnerships (PPPs)!

Demand analyses are needed at the identification, pre-feasibility and feasibility stages of any major investment project in order to reduce the revenue risk for the project sponsors. The analyses should become progressively more detailed as the project moves towards the feasibility stage and the final decision. CHAPTER 2 discusses the timing of the tools related to demand analyses, which are presented in this text, in relation to other project cycle planning tools.

The demand analyses will be highly useful no matter how the project investment is financed, whether through international development finance, commercial finance, public budgets or some public-private partnership arrangement (or a combination hereof).

Demand analysis using stated preference methods is frequently used when a major part of the financing comes from an international financial institution (IFI) such as the World Bank or the EBRD. These organisations tend to have a strong focus on project viability and will require some form of demand analysis[1]. Some form of willingness to pay analysis is generally required by all major donors to demonstrate the long-term sustainability of any major infrastructure investment.

Private commercial financiers emphasise the assessment of project risk. Thus, comprehensive and reliable demand analysis is very important for limited recourse lending, but also when there is, for example, a municipal guarantee. In any case, good banking practice would suggest the lender to require that the borrower has carefully considered the revenue risk.

Investment projects funded from public budget transfers ought to be subject to the same rigorous examination of project viability as projects with IFI funding. The demand analysis tools provided in this toolkit may significantly enhance the quality of the individual projects in the public investment portfolio. It is recommended to use these (or similar) tools for major public-funded infrastructure projects.

Various forms of public-private partnerships are gaining ground within the water services sector. These are typically initiated at a point in time, when the public water utility in question needs to undertake a major investment programme and finds that it (or the backing public administration) is short of cash[2]. For the private partner, there are different approaches to dealing with the inherent uncertainty in such a situation. The private partner may try to ensure a positive cash flow throughout the partnership period, to obtain guarantees for payments or to obtain a very flexible arrangement in relation to the future service delivery and tariffs. Explicit consideration of customer perceptions, affordability, demand and political acceptability reduce uncertainty by lowering revenue risk. This may be achieved by using the tools in this toolkit[3].

3 For example: The World Bank "Toolkits for Private Participation in Water and Sanitation" Volume 3: "What a Private Sector Participation Arrangement Should Cover" p. 30 f. (World Bank Water and Sanitation Group, Washington D.C. 1997) discusses the revenue risk at length. The methodologies of this toolkit may be used to address a number of the issues raised as key issues by the World Bank in the above mentioned publication.

4 This publication includes both water supply and wastewater services under the wording "water services". The key distinction is not whether the service provider is private or public, but rather whether the service is marketed or not.

The toolkit is applicable for small and large infrastructure investments. However, in view of the approximate total level of effort, the full toolkit is only expected to be used in connection with infrastructure investments of EUR 5 million or more. For smaller infrastructure projects, it will often make sense to reduce cost of preparation by using only a subset of the full toolkit. It is recommended that a case-by-case approach be used when selecting which tools to apply. A standard subset of tools is presented in CHAPTER 7

1.4 For whom?
Sponsors of marketed water services!

The toolkit is applicable and relevant for all marketed water services[4]. However, the tools have been specifically aimed at services where a large part of the consumers are households.

Household consumers account for by far the largest share of water demand for most utilities in Western Europe and CEE. In the CIS, industry was sometimes a very large water consumer and there were (and often still are) large cross-subsidies from the industry to the household consumers. As a consequence of the demise of traditional industry and the change in water use patterns by the remaining industry the households tend to account for a larger share of the consumption in the CIS, similar to the pattern in Europe.

A different approach should be applied to analyse the water demand of households and industry, respectively. For industry: changes in the composition of the sector, changes in the composition of production and the introduction of cleaner technologies are all major drivers of the demand for water and wastewater services. Proper analysis requires industry – and sometimes plant-specific – assessments of the alternatives to buying water from / discharging wastewater to the public system. This again means that guidelines for analysis need to be industry specific to be really useful. In this toolkit, we focus on the analysis of household demand.

Many well-run enterprises undertake regular analysis of customer perception and willingness to pay for the services they provide. The methodology suggested in CHAPTER 4 has proved useful for water utilities in the United Kingdom among other countries. The best water utilities in Central Europe also undertake regular customer satisfaction analyses. These enterprises may want to explore the methodology in CHAPTER 4.

The tools are intended for use by the project sponsor whether this is a national or municipal administration, a strategic investor, the daily operator of a water and wastewater utility or possible donors, IFIs and other lenders. While much information in this book may be of interest to policy makers, this toolkit has been written for their advisors / consultants. It is aimed at specialists who are familiar with technical, economic, market research and policy analysis, but who are looking for systematic and tested methods to assess consumers' willingness to pay (WTP), and the affordability and political acceptability of water prices in the CEE and CIS countries.

1.5 How?

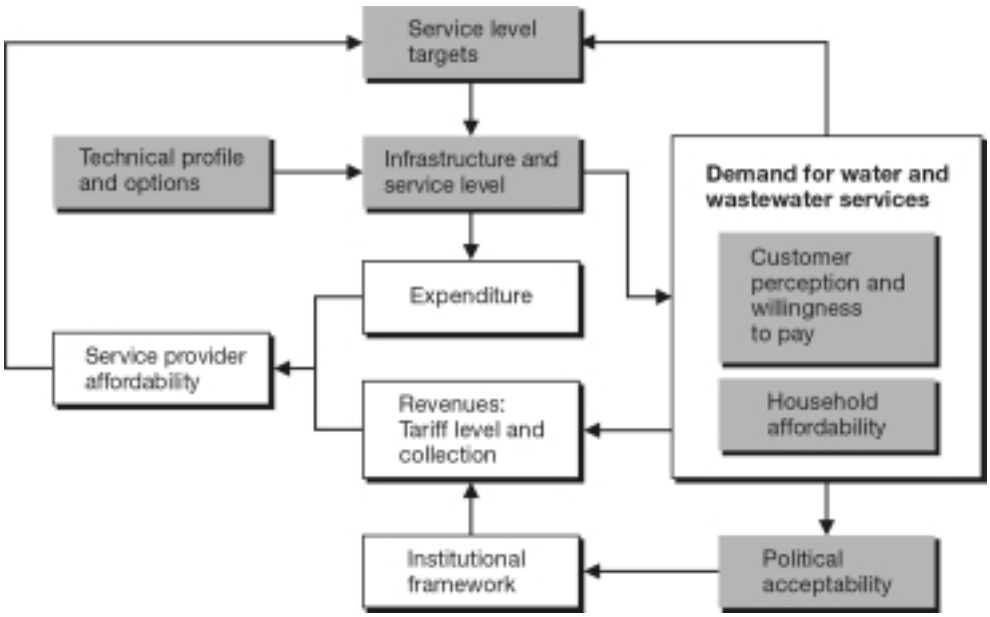
As part of an iterative determination of supply of service and demand!

The toolkit provides a set of tools to assess the future demand for water services and the political acceptability of the related consumer charges. These tools should be used as part of an iterative assessment of service levels, technical options and related expenditure, on the one side, and the demand for services, tariffs and resulting revenues, on the other side. The toolkit provides a methodology and tools to consider the following issues:

- The service level targets, which should be set by decision-makers with due consideration to environment and health regulations, service provider affordability and consumer demand for water and wastewater services;
- The future infrastructure investment needs, which will be determined by the present technical profile, the available technical options and the service level targets;
- The demand for water and wastewater services and affordability, which in turn determines the tariff level and collection both directly via consumers' consumption and propensity to pay the bills and indirectly via the influence of political acceptability of tariff level and enforcement of payment;
- The political acceptability that influences the tariff level and collection rates via the institutional framework (utility autonomy, regulatory control incl. tariff setting, enforcement of payment etc.).

Each of the issues above will have an impact on the expected future revenues and expenditure of the project and of the responsible service provider. In this way, proper assessment of the issues is necessary to achieve proper assessment of project viability. The iterative nature of these factors is illustrated in Figure 1.1.

Figure 1.1: Water and wastewater infrastructure investment. Issues considered in the toolkit.



The service provider affordability is determined by the duality of expenditure, and revenue, the latter consisting primarily of tariffs collected and public budget transfers.

It is essential to keep in mind the link between supply and demand and to consider that this link develops over time. Therefore, the toolkit emphasises the need for an iterative approach to determine the "appropriate" level of service, starting from a rough idea of technical options and demand for services and working towards narrowing the options through a funnelling process to a specific project implementation plan. The dynamic and iterative nature of the suggested approach is discussed further in CHAPTER 2.

The toolkit focuses on acceptability of water prices and demand for services!
The toolkit provides a set of tools to address the issues highlighted in grey colour in Figure 1.1. The focus of the toolkit is on the acceptability of future water prices and thus on the "demand side", i.e. the tools in the right column of the figure. Consideration of the "acceptability of water prices" is likely to require systematic consideration of the political acceptability of increased tariffs etc. Therefore, tools for the assessment of political acceptability have been included.

A practical toolkit – not a traditional consultant's report!
In addition to the "recipes" provided, there are other ways to address each of the highlighted issues. However, the purpose of this report is not to provide an overview of all possible methods of assessment, but rather a practical and generally accepted sub-set of these methods. The sub-set has been selected in dialogue with the EBRD, DEPA, the World Bank and commercial project sponsors. However, the responsibility for the final selection remains that of the consultant.

As any good cook knows, a recipe must always be adapted to the ingredients available and to the taste of customers. This is also the case for the present toolkit. The tools must be tailored to the data and information available and, in particular, to the specific issues that need to be addressed in each case.

1.6 Structure of the main text

The purpose of this toolkit has been to provide a thorough guide to a set of high quality tools, which would enable the user to provide robust answers concerning prospective future demand for the services provided by the infrastructure in question.

Each chapter includes:
- A step-by-step recommended approach (the first text box of each chapter).
- Pertinent considerations for the consultant who tailors the tool for use in a particular situation.
- Text boxes with illustrative examples in support of these considerations.
- Practical "tools" such as formats for the design of questionnaires, topic guides, standard information sheets etc.

Table 1.1 lists the tools provided for the highlighted topics in Figure 1.1 and indicates the chapter in which the tools are presented.

Table 1.1: Overview of topics and tools included in the toolkit

Topic	Tool		Chapter / Appendix
An iterative approach to service, technical solutions, demand and tariffs	Tool:	The integrated approach	Chapter 2
	Tool:	Proposed Scope of Works for inclusion in Terms of Reference	Appendix 2
Service level targets, technical profile and options; and infrastructure and service levels	Tool:	Establishing a technical, service and expenditure baseline	Chapter 3
	Tool:	The technical profile summary	Appendix 3
Customer perceptions and willingness to pay	Tool:	Qualitative research approach	Chapters 4.3-5
	Tool:	Generic topic guide	Appendix 4
	Tool:	Quantitative research approach	Chapter 4.6
	Tool:	Estimation of willingness to pay	Appendix 9
	Tool:	Generic example of survey design	Appendices 5-7
Demand for water services	Tool:	Data requirements, statistical methods	Chapter 4.7
Household affordability	Tool:	Affordability assessment based on macro data;	Chapter 5.3
		Household affordability (quantitative survey)	Chapter 5.4
		Tariff design and transfers	Chapter 5.5
	Tool:	Example of a brief household expenditure survey	Appendix 8
Political acceptability	Tool:	Analysis of attitudes of political parties	Chapter 6.7
	Tool:	Analyses of attitudes and assumptions	Chapter 6.8
	Tool:	Screening of key actors	Appendix 10
General	Tool:	Example of Information Note	Appendix 11
	Tool:	Glossary	Appendix 12

1.7 Preparation of the toolkit

The present toolkit is based on three types of information:

- **Best practice** (based on existing studies);
- **Case studies and desk studies ;**
- **Dialogue with key partners.**

1.7.1 Best practices

Best practices were extracted from existing research and studies related to water and wastewater investments, and an initial set of "best practice tools" was collected. The information sources used included:

- Articles published in academic journals;
- Working papers from conferences etc.;
- Studies carried out in preparation of water and wastewater investments.

The list of literature used is provided in Appendix 1. The list also includes a sub-set of suggested literature to provide a good introduction to the practical and theoretical issues at stake.

1.7.2 Case studies

Three case studies were undertaken, whereby these tools were tested in the field in the cities of

5 The desk studies were carried out under other contracts. They have been included because they have utilised one or more of the tools suggested in this toolkit. However, none of the desk studies have used the full palette of tools suggested. Only the studies in Lviv and Sevastopol used stated preference methodology.

6 See, COWI (1997) and COWI (1999)

7 See Rambøll (1999). Additional work by Estivärki

8 See Milieu Ltd and APPC (2001)

9 See CarlBro Management (2001)

Brno, Poznan, Kaliningrad. The case studies are reported in Appendices 13 - 15. The reader should note that the case studies were carried out in the years 1999 - 2000. The main purpose of the case studies was to improve the toolkit. Thus, case study facts may have changed since the studies were undertaken, and the case studies may not represent the current key revenue risk issues for the cities.

In addition, **desk studies**[5] of existing material were undertaken for **the cities of Lviv and Sevastopol in the Ukraine**[6], as well as for **small towns** in **Estonia**[7]**, Ukmerge in Lithuania**[8] and for **Borovichi, Novgorod Region, Russia**[9]. While the main text and its text boxes refer to all these studies, only the two last mentioned desk studies have been written up as a separate appendix.

A number of **criteria** were applied, and the case study cities were chosen in order to cover:
- Number of inhabitants
- Operator ownership
- Quality of future service and type of service to be provided, viz.:
  - Level of current water services
  - Investments in wastewater or water supply
  - Service improvements versus avoidance of service deterioration
- History of price increases
- Weak enforcement of tariffs in the past

The case-study cities are described in the table below.

Table 1.2: Key parameters of the case studies

Case	Inhabitants	Description
Brno, Czech Republic	400,000	Focus on wastewater service investments. Existing private sector operator, history of significant water tariff increases.
Poznan, Poland	678,000	Focus on water supply, current services are good and hence focus on willingness to pay to avoid service deterioration. A concession is being planned.
Kaliningrad, Russia	450,000	Focus on water supply, current services are inadequate, there is a history of significant water tariff increases. The operator is the public sector.

Table 1.3: Key parameters of the desk studies

Case	Inhabitants	Description
Estonia	1,500 - 20,000	A number of small towns in Estonia. Focus on water supply improvement.
Ukmerge, Lituania	31,000	Small town, focus on water and wastewater services.
Borovichi, Novgorod, Russia	60,000	Small town, focus on water and wastewater services.
Lviv, the Ukraine	790,000	Large town, focus on water supply improvement.
Sevastopol, the Ukraine	355,000	Large town, focus on water supply and wastewater services.

Based on the results of the field tests, the tools were revised.

1.7.3 Dialogue with key partners

Throughout the process, the team had discussions with colleagues in the following organisations:

- The European Bank for Reconstruction and Development (EBRD);
- The Infrastructure Department of the World Bank;
- The International Finance Corporation (IFC);
- The Danish Environmental Protection Agency (DEPA);
- The Regional Environmental Centre (REC) Szentendre, Hungary;
- Project sponsors including International Water Ltd., Severn Trent and Suez Lyonaise des Eaux;
- Other consultants (notably the Paribas team advising the city of Poznan);
- Municipalities and local utilities, in particular the City of Brno and BVK, the City of Poznan and PWIK, the city of Kaliningrad and the Vodokanal in Kaliningrad.

These partners all contributed with ideas and inspiration, and we are grateful to all discussion partners. Preliminary results of this project have been presented at international conferences in London, Prague and Wiesbaden. Feedback from these conferences has also been incorporated in the toolkit.

1.8 Use of the toolkit under different circumstances

Based on best practices, the case studies and the dialogue with key partners, we are able to make the following main observations in relation to each of the selection criteria above:

Number of inhabitants: The Small Town Toolkit

In order to assess the use of the tools in both large and small cities, cities of different size were chosen. On this basis, we can conclude that the tools may be used in both large and small cities. However, irrespective of the size of the city, the use of the full set of tools is prohibitively expensive in connection with projects of less than approx. EUR 5 million. We have found that the value of the investment is a better criterion than the number of inhabitants.

At the same time, in many small municipalities a substantial part of the project investment costs are covered through national or international (e.g. ISPA) grant programmes, where the project sponsors have acknowledged up front that they will not recover their contribution through user charges. In this situation the establishment of appropriate, affordable and not too ambitious service level targets becomes a key issue.

For small towns, we recommend specific parts of the toolkit to be used. Jointly these parts constitute what we may call "The Small Town Toolkit", see CHAPTER 7.

Operator ownership: Private versus public sector operator

In order to test the robustness of the methodology in relation to the question of private versus public operation, we choose to use the methodology in a city with public service provision (Kaliningrad), a city with public, but planned private service provision (Poznan) and a city with private service provision (Brno). The respondents in Poznan and Brno showed little awareness of the ownership structure of the enterprise. The field studies gave no indication that the customer perception study should be designed differently depending on ownership structure. The field studies indicated a much larger propensity to interfere in tariff and utility decisions in Kaliningrad with its public service provision. However, this may be as much a reflection of the traditions of Russian administration as the public ownership in itself. We do not have the material to make a judgement hereon.

Quality of future service and type of service to be provided

In order to test the robustness of the methodology in relation to key future service issues, we choose three different issues for the willingness to pay analysis. The issues are:

- Level of current water services
- Investments in wastewater or water supply
- Service improvement versus avoidance of service deterioration

Level of current water services

The tools proved effective both in cities with current good quality water services (Brno and Poznan) and in cities with current poor quality water services (Kaliningrad and Lviv).

Investments in wastewater or water supply

The tools were robust both in relation to water supply (use value) such as in Kaliningrad and in a situation where the consumers should relate to environmental improvements and EU compliance as a consequence of wastewater treatment investments (non-use value) such as in Brno.

Service improvement versus avoidance of service deterioration

These two issues require different designs of the willingness to pay analysis. The methodology proved robust as it was able to deal with a situation where the consumers should relate to the risk of service deterioration in the future (Poznan).

History of price increases

The hypothesis has been advanced that significant increases in water tariffs would lead to a lower willingness to accept subsequent water tariff increases. This could be the case if the customers found that the service improvements did not justify the increase in tariff, or if the increase in tariff caused affordability problems for low-income households.

We chose two cities with a recent history of significant water tariff increases (Brno and Kaliningrad) and a city without such history (Poznan). Whereas the Kaliningrad case study seems to provide some justification of the hypothesis, this did not seem to be the case in Brno. In Kaliningrad, we conducted the survey only six months after a 150 per cent increase in price. The survey results may support the hypothesis – or they may simply be a consequence of low willingness or ability to pay. In any case, we recommend not to undertake a survey shortly after a major price increase.

Weak enforcement of tariffs in the past

Earlier use of the stated preference methodology in Lviv, the Ukraine, illustrated that consumers could relate sensibly to scenarios of future tariff increases, even in a situation where the current enforcement of payment was weak.

1.9 Resources required

The level of effort required for the analysis will depend on the characteristics of the project. To carry out the analysis suggested in CHAPTER 3 to CHAPTER 6, a total of 21 - 32 person weeks (excl. translators, interviewers etc.) and 20 - 26 calendar weeks will be required. This is illustrated in Table 1.4. More information on the appropriate level and timing of the suggested effort is given at the beginning of each chapter.

Table 1.4: Resources required for the toolkit

Task	Person weeks	Calendar weeks
Technical, service and expenditure baseline	2-3	2-4
Customer perceptions, willingness to pay and demand for water	12-16	14-18
Household affordability	3-7	6-8
Political acceptability	3-5	6-8
Communication with recipient	1	4
Total	21-32	20-26

Disclaimer: The resource requirement has been estimated by COWI and is not necessarily endorsed by DEPA or EBRD.

Note: Total person weeks represent the sum of person weeks for each task.
In calculating total calendar weeks, we have assumed that the technical baseline is carried out first, and subsequently the next three activities are carried out in parallel. We have assumed that the recipient needs time to give directions to the advisor / consultant. This response time has tentatively been set at four weeks, but may, of course, differ from project to project.

In small municipalities, where the total level of investment cannot justify the use of the full range of tools, we recommend the use of a subset of tools. We have developed a standard subset called the Small Town Toolkit. The resource requirement for this is illustrated below. More information on the appropriate level and timing of the suggested effort is given in CHAPTER 7. It is recommended to decide on the actual set of tools to be used on a case-by-case basis.

Table.1.5: Resources required for the Small Town Toolkit

Task	Person weeks	Calendar weeks
Technical, service and expenditure baseline	1-2	4
Customer perception, willingness to pay and demand for water	2-3	4
Household affordability	1	2
Political acceptability	2	4
Communication with recipient	1/2	2
Total	6-8	10

Disclaimer: The resource requirement has been estimated by COWI and is not necessarily endorsed by DEPA or EBRD

CHAPTER 2

THE TOOLKIT AND THE PLANNING PROCESS

2.1 Introduction

The **purpose** of this chapter is to provide guidance as to how to use the toolkit to deal with the interlinkages between the supply side and the demand side for water services. The supply of water services is a function of the current technical profile and operations, the service level targets and the resulting cost and expenditure, whereas the demand for water services is a function of customer perception, willingness to pay and affordability. Political acceptability may influence tariffs and their collection.

The **target group** for this chapter is **all readers of the toolkit** (or parts hereof).

The toolkit is intended for use i relation to both traditional investment projects and with the establishment of a public-private partnership within the water services sector. Some tools are to be used in the pre-feasibility phase, and other tools are to be used in a later phase of the project planning cycle.

When describing the **project cycle**, we distinguish between traditional investment projects and PPP projects. The two cycles are very similar in the project identification and pre-feasibility stages, but differ thereafter. The timing of the use of the toolkit for a traditional investment project is illustrated in Figure 2.1 and Figure 2.3. The timing of the use of the toolkit for a public-private partnership project is illustrated in Figure 2.2 and Figure 2.3.

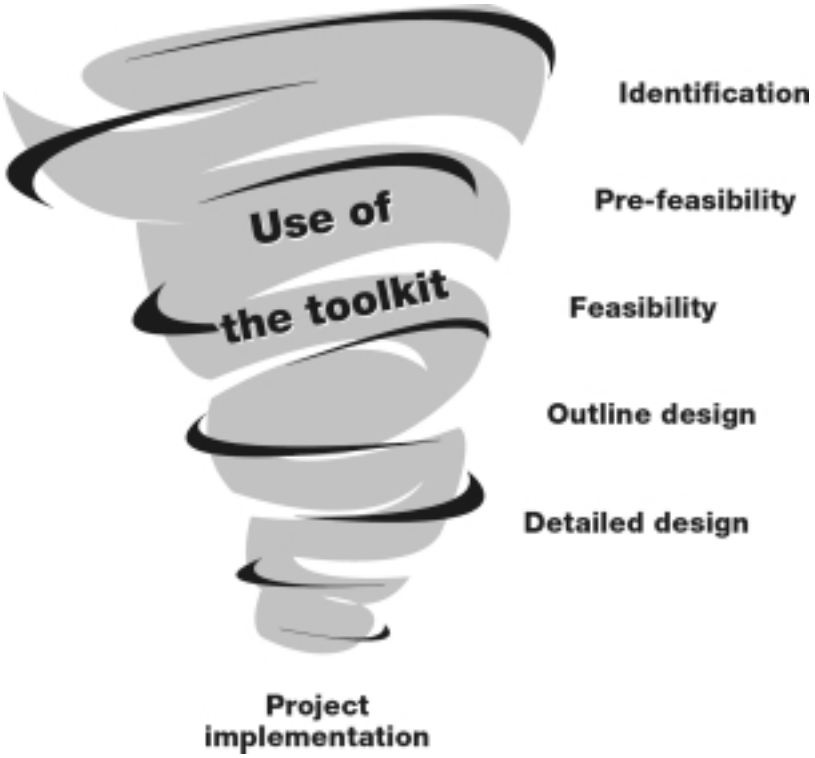
As indicated in the previous chapter, the determination of the appropriate future service level and thus the needed investment and operational characteristics ought to be an iterative process, where technical and cost considerations are matched against the prospective customer demand for services. For each step, these considerations are, at the same time, narrowed to deal with fewer options and expanded to increase the accuracy and detail of the analysis. It is thus, at the same time, a funnelling and iterative process that takes place.

The characteristics of the first step (**project identification**) is similar in the traditional investment project and the PPP situation. Project identification takes place in response to an acknowledged problem (such as a polluted river) or a regulatory requirement (such as national implementation of the EU water framework directive). At this stage, the initial ideas about the solution and the service level are formed. These ideas may focus on technical and financial issues, or they may include consideration of a new institutional set up such as a public-private partnership.

2.2 The project cycle and a traditional investment project

The next step (the **pre-feasibility** stage) should include an initial assessment of the institutional and regulatory framework, the financial envelope (which in turn depends on water utility revenues and thus on consumer demand) and the technical options. This stage defines what specific issues need further exploration during the following stage, and defines how these issues should be explored. For a traditional investment project this may, for example, be reflected in the terms of reference for a feasibility study.

Figure 2.1: Project cycle and timing of the use of the toolkit for a traditional investment project



During the **feasibility** stage, the assessments defined by the pre-feasibility stage will be undertaken. In most cases, it will be relevant to undertake the demand analysis for which tools are presented in this toolkit. The demand analysis can only be omitted if there are no technical and service level alternatives (and thus no cost alternatives) and if the demand is not sensitive to price. The scope and detail of the demand analysis to be undertaken will, among other issues, depend on the size of the investment, the sensitivity of demand and the autonomy of the water utility. In the following chapters, we provide advice on the suggested scope, approach, timing and resources required depending on the circumstances.

The feasibility stage ends with a feasibility report, which suggests one (or a couple of) approach(es) to the institutional, legal and organisational set up of the project (and utility, if relevant), the technical solution (and the consequent expenditure profile), the future tariff policies (and the consequent expected tariff revenue profile) and project funding.

For a traditional investment project the last steps will be **outline design, detailed design**, and then **project implementation.**

2.3 The project cycle and a public-private partnership (PPP) arrangement

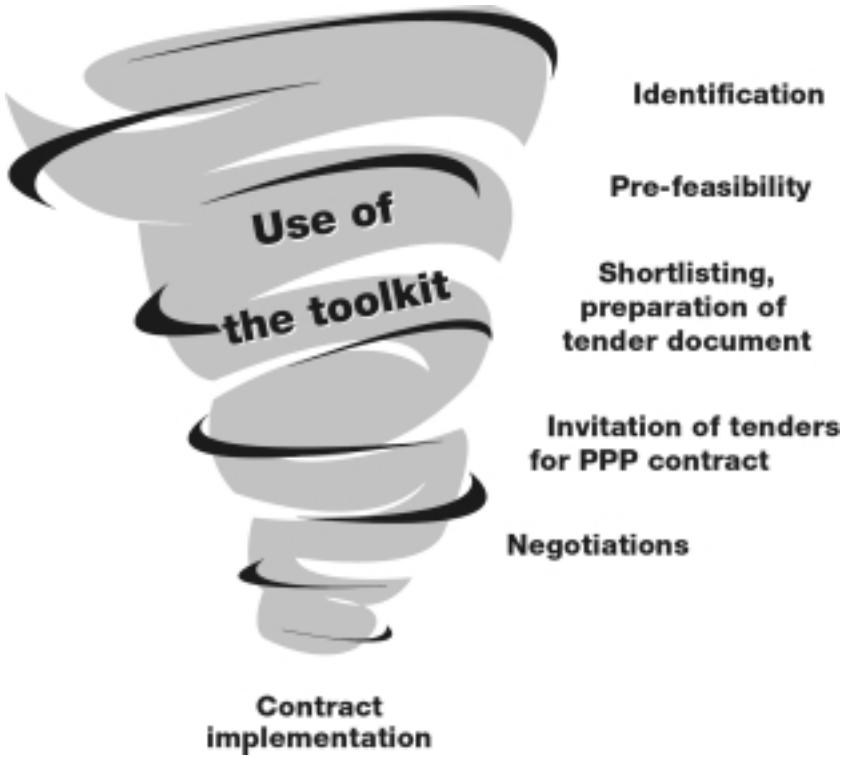
The project identification (and to a large degree the pre-feasibility) stages are similar for a traditional investment project and a PPP arrangement.

Also in the case of a PPP arrangement, the **pre-feasibility phase** should include an initial assessment of the institutional and regulatory framework, the financial envelope (which in turn depends on water utility revenues and thus on consumer demand) and the technical options. When a PPP arrangement is aimed for, the pre-feasibility stage will define which studies need to be carried out in order to become part of the material to be provided to the bidders for a lease, concession or whatever form of private participation is foreseen.

The next steps in the case of a public-private partnership are the identification of a potential partner through **shortlisting** and the **preparation of bidding material.** This material should include detailed information on the current infrastructure of the water and wastewater system, the service provided (both as perceived by the customers and "objective" parameters), the legal regulations and the institutional set-up pertinent for the utility, detailed financial information as well as a good description of the demand for water and wastewater services. The latter is done using the present toolkit. The use of the toolkit for the pre-feasibility and the shortlisting and preparation of bidding material stages is illustrated in Figure 2.2.

The private partner will want to reduce his revenue risk. There are many ways of doing this. One of the best ways is to have a reliable and comprehensive assessment of future demand and revenues. The existence of a proper demand analysis which has been prepared using the principles of the toolkit can be instrumental in providing such an assessment. Of course, there are other ways for the private partner to reduce his risk. However, many of these, for example "take-or-pay" agreements, just transfer the revenue risk to the public partner, whereas a good demand analysis and resulting changes in the project design lower the revenue risk.

Figure 2.2: Project cycle and timing of the use of the toolkit for a public-private partnership (PPP) arrangement

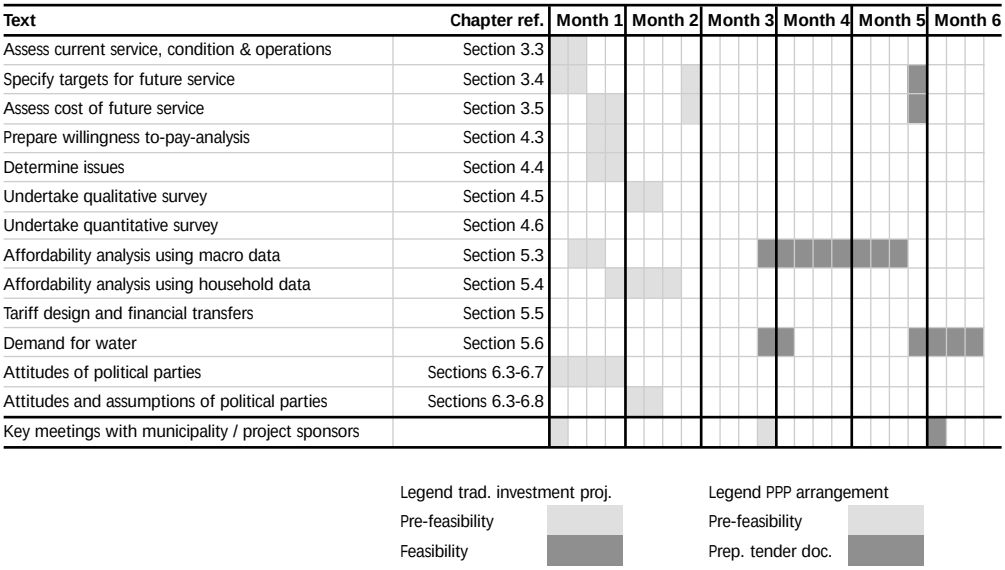


The PPP negotiation process and contract signature includes, among other things, a formal simultaneous agreement on a number of issues including, but not limited to, service level targets, on the one hand, and payments and tariffs, on the other hand. This process has a greater chance of successful completion the more issues that bear on risk have been dealt with in the previous steps.

2.4 The toolkit in the project cycle – Overview and timing

The suggested timing of the use of each of the tools is discussed in the chapters presenting the tools. Figure 2.3 presents an overview of each of the main tasks for which tools are provided in this kit as well as the suggested timing.

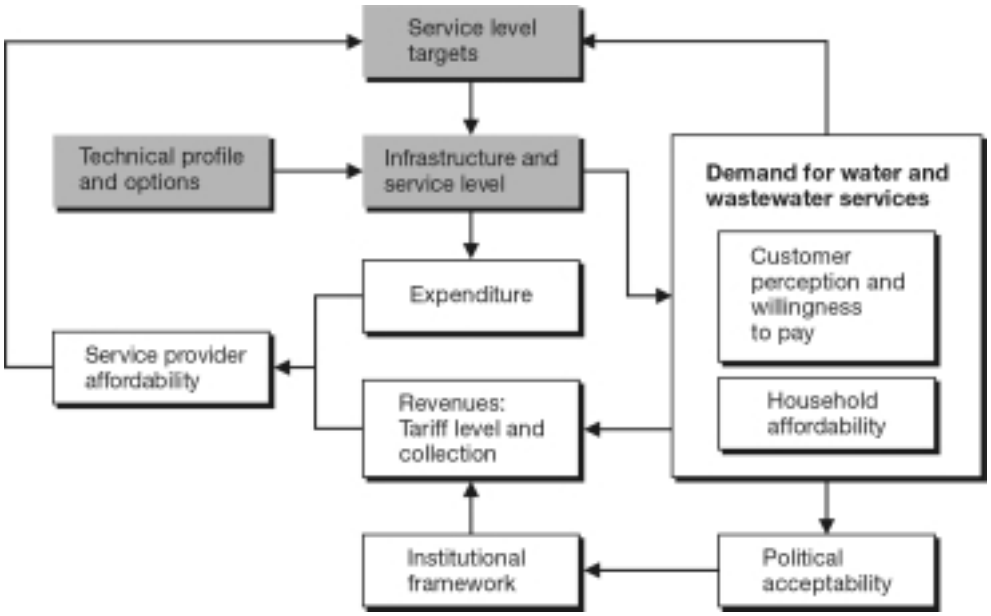
Figure 2.3: Overview of the toolkit tasks and their timing



The iterative nature of the process has been indicated by illustrating that the service targets and their costs are re-assessed twice. First, following the initial qualitative willingness to pay analysis and the initial policy analysis. Then the targets are re-assessed following the quantitative willingness to pay analysis. In a traditional investment project, these two assessments take place in the pre-feasibility and the feasibility phase, respectively. In the case of a PPP arrangement, the first re-assessment of future service targets takes place in the pre-feasibility phase. In some cases there may be a further re-assessment as part of the bidding and negotiation process.

CHAPTER 3

TECHNICAL, SERVICE AND EXPENDITURE BASELINE



3.1 Introduction

The **purpose** of this chapter is to provide guidance as to how to establish an initial assessment of the supply side, viz.: the current technical profile and operations, the service level targets and the future infrastructure, service level and resulting cost and expenditure. We call this initial assessment of the supply side: A technical, service and expenditure baseline.

The methods and tools presented in the current chapter are relevant for cities in the CEE and CIS countries including small towns. The **target group** is **experts within water utility planning.** However, the text also allows other stakeholders involved in water and wastewater planning to obtain an overview of the suggested level of analysis.

The text is of relevance for the planning of traditional investment projects as well as a public-private partnership arrangement such as a concession or a BOT.

The establishment of the technical, service and expenditure baseline is one of the first preparatory steps following problem identification. This applies whether the project is a PPP arrangement or a traditional investment project in a public utility.

3.2 Suggested approach, timing and resources

3.2.1 Approach

Any demand analysis, including the suggested willingness to pay analysis and political acceptability assessments, must take the current technical and service level situation as its entry point.

Text Box 1: The recommended approach for establishing a technical, service and expenditure baseline

1. Assess the current service level, conditions and operations (Section 3.3)
   - collect existing reports
   - collect existing data through questionnaires and interviews
   - visit selected key facilities (to confirm condition)
   - fill in the technical profile summary (make judgements where necessary).
2. Specify the targets for future service (Section 3.4)
   - establish a "without project" scenario
   - establish an initial realistic "with project" scenario specifying the future service levels
   - discuss the targets for future service levels with relevant people such as water company officials, city officials, etc.
   - outline the technical options resulting from each scenario.
3. Assess the expenditure needs of alternative future service levels (Section 3.5)
   - review existing studies for assessed expenditure related to operating and maintaining the existing system; or
   - review international experience for similar a system and assess what country specific price corrections and site specific quantity corrections will be necessary to transfer international experience;
   - estimate the "full" O&M expenditure of the existing system. In the CIS, the "full" O&M expenditure may be higher than the actual expenditure;
   - assess existing investment plans / proposals of the water utility
   - guesstimate necessary investment costs to meet alternative service levels based on discussions with relevant people such as water company officials, engineers, etc.
   - guesstimate financing terms based on discussions with key people in the water company, consultants, etc.
   - calculate roughly the tariffs needed to cover the O&M expenditure and the (net) expenditure resulting from investment and financing

The **current technical situation** should be described - as objectively as possible - with respect to the current service levels provided. For this purpose, the use of the "Technical Profile Summary" containing a number of simple indicators / service characteristics is envisaged, see Appendix 3.

Based on the current service level, condition and operations, an initial set of **future service level targets and the deadline for achieving these targets** must be specified along with corresponding rough estimates of investment expenditure needs and operational expenditure.

The current technical situation and the service targets (scope and timing) will form the background for:

- the formulation of the questions to be used in the willingness to pay survey;
- the tariff assumptions used in the affordability analysis; and
- the structured interview guide to be used for the political acceptability analysis.

Finally, the results of the willingness to pay, affordability and basic political acceptability analysis provide inputs to the determination of applicable and affordable service levels leading to the identification of priority investment programmes and corresponding financial arrangements (including tariff development). Again, it should be noted that timing of the achievement of future service level may be very important in relation to the cost of investment programmes.

The identification and timing of affordable, acceptable and feasible service levels (in the narrow sense that the customers are willing to pay for them) constitute the first "round" of the iteration. This first round of iteration should take place during the **pre-feasibility** stage.

In the second round, the priority investment programmes are identified and conceptually designed. At the same time, financial and institutional arrangements are designed. For traditional investment projects, this second round of iteration should take place during the **feasibility** stage. For PPP arrangements, the tender material and the bidding process will typically either define a service level to be achieved at the best tariff, or request the best service to be offered at a given tariff.

The simultaneous consideration of "acceptable tariffs" and service level offered is - or ought to be - the same whether "the project" is a PPP arrangement, such as a concession contract, or a traditional investment project by a public utility. In both cases, the determination of an acceptable and affordable service level is the key to ensuring both the "optimal" future service level and the revenue stream necessary to pay for the related investments.

3.2.2 Timing of the analysis

The optimal timing of establishing the technical, service and expenditure baseline does not differ depending on whether the project is a PPP arrangement, such as a concession agreement, or a traditional investment project in a public utility. In both cases, this is one of the first preparatory steps following problem identification.

For a **traditional investment project** in a public utility, the establishment of the technical, service and expenditure baseline should be undertaken during the pre-feasibility stage.

For a **PPP agreement,** such as a concession, a BOT etc., the optimal timing of the baseline study would be prior to the establishment of a short list of firms who are invited to submit a bid for the concession, BOT etc. and prior to the preparation of the tender documents. In practice, this implies that the technical, service and expenditure baseline should be established during the pre-feasibility stage. The municipality will find the baseline highly useful in defining its service level requirements in a precise manner for the tender documents. Furthermore, the short-listed firms may find it useful to have an indication of the baseline expenditure needs as well as an indicative assessment of the expenditure needs of alternative realistic service levels, although they are likely to make their own assessments hereof.

3.2.3 Resources required

The technical work, as described in Text Box 1, requires that adequate engineering resources be allocated. It is essential that the technical staff is highly experienced in conducting similar assignments in the CEE and / or CIS countries. In that respect, the most critical task is task 3, assessment of the expenditure needs of alternative future service levels.

If investment planning reports are available, for instance in the form of a previous feasibility study or preparations for private sector participation, the assessment of expenditure and expenditure needs will be rather simple. However, this will typically not be the case early in the process.

Compared to the "standard approach", we suggest that much less engineering work should be carried out at this early stage. Only very rough expenditure needs assessments are carried out, matching the requirements of establishing broad future tariff levels. Based on the experience gained during the field testing of the toolkit, it is assessed that a highly skilled engineering input of about two to three person weeks is required, of course depending on the level of data readily available. In this chapter, we have defined minimum but adequate and sufficient levels of technical inputs for an initial assessment of future expenditure needs. However, the need for full-fledged technical assessments during the feasibility stage remains unaltered.

The suggested steps in the analysis are outlined in the following sections.

3.3 Assessment of current service level, conditions and operations

The first step will be to collect technical data to serve as indicators of service and (to a lesser degree) efficiency. This collection of technical data for the analysis of willingness to pay, affordability and political acceptability will take place at a stage where the technical assessments are typically not yet very detailed. Therefore, it is suggested to operate with a limited set of data, which is used to identify the technical options and expenditure needs at a level corresponding to the requirements of the above-mentioned analysis.

The data sources will be existing reports, where available, supplemented with data collected from the water utilities through a simple questionnaire and/or discussions.

The data is compiled into a "**Technical Profile Summary**", see Appendix 3.

All data presented in the Technical Profile Summary should reflect the actual situation rather than a design/norm situation. The actual data is not necessarily equal to the design data. Where discrepancies are identified, specific notes should be prepared.

The current water and wastewater systems, their condition and the overall service level should be described on the basis of the collection and assessment of the above data and benchmarked to international service levels in general, supplemented with discussions and selected sample visits to a limited number of facilities.

3.4 Specified targets for future service

Based on the assessment of the current situation, realistic scenarios for future service levels should be made. These scenarios should, as a minimum, include a "without the project" and a "with the project" scenario.

It is important to consider the "without the project" scenario. The future service level of the "without the project" scenario is unlikely to be similar to the current service level. This will only be the case if operation/maintenance and re-investment are adequate to maintain the current service. Otherwise, the future service level in the "without the project" scenario will most likely be worse than the current

10 The case study in Poznan prepared for this toolkit is an example of such an analysis.

service level. The timing of improvement is an important issue to be considered in both scenarios. For the technical analysis, but in particular for the willingness to pay analysis, it is crucial to describe the "without the project" scenario properly. In some cases, the willingness to pay analysis should focus on the willingness to pay to avoid deterioration in service level, rather than the willingness to pay for improvements[10].

The sections below provide an indication of the considerations that are likely to be relevant in the CEE and the CIS countries, respectively.

3.4.1 Service objectives - CEE Countries

Generalising the current service level situation in urban areas of the CEE countries, one could say that, today, the level of services provided is, in many aspects, approaching West-European service levels.

The coverage of water and wastewater networks is high (90 - 100%) within the urban areas, and most utilities provide 24 hours of continuous water supply. In many cases, the water production facilities appear to be of a reasonably high standard (have recently been upgraded in several places). The main bottlenecks are the water and wastewater networks, which, in many cases, are old (or very old - some parts being up to 100 years old). Rehabilitation of the networks has been and is being carried out at a certain level, but further rehabilitation will be required to sustain the current service levels.

The case studies revealed that service level problems typically relate to water quality and reliability of supply (number of breakdowns). As regards water quality, the extent of the problems must, however, be characterised as minor; typically the failure rate of the samples taken was less than 1%.

Wastewater treatment is partly provided, although not to the level of the standards required by the EU. As many CEE countries are acceding to the EU, large investments in improved wastewater treatment (notably nutrient removal and sludge treatment) are being made in response to the requirement to fulfil the environmental acquis.

Water sector investments in the CEE countries typically have two key objectives. First, to achieve compliance with EU standards, and second, to sustain the existing service level, perhaps with improvement in quality and reliability.

3.4.2 Service objectives - CIS Countries

In most municipalities in the CIS countries, the current water sector service levels are considerably below those in the CEE countries. Many water utilities are not able to provide a 24-hour continuous supply. In some cases, utilities are not even able to supply water every day. The water quality is often not consistently adequate and deteriorates over time. The water and wastewater networks appear to be in a very poor condition as a result of a backlog of investment in maintenance and repair. High investments are required even to maintain the current service level.

Experience from the CIS countries has revealed that the establishment of service objectives equal to the service levels applied in Western Europe will often require substantial investments, far beyond the affordability of the population and the financial capacity of water enterprises and other sector institutions. Instead, most water sector investment projects in the CIS countries focus on **priority**

11 Such as the EBRD (2000): Poland Water Sector Benchmarking Study

rehabilitation of facilities followed by priority investments to sustain the achieved service level. The rationale behind this priority rehabilitation philosophy is, of course, to achieve the required benefits from already made investments in physical infrastructure (the existing facilities) through upgrading (rehabilitation), before investing in new infrastructure (expansion of the systems).

In some municipalities, even rehabilitation is not affordable. This is typically the case in cities (other than the capital) in countries such as Georgia and Moldova where the GDP has fallen drastically since the dissolution of the Soviet Union, at which time the infrastructure in these cities was relatively well developed. In such municipalities, it may be relevant to think in terms of strategic dis-investments in municipal infrastructure. This way, the scarce resources for operation and maintenance and for rehabilitation could be channelled to key infrastructure segments, and non-essential segments could be left to deteriorate and/or be replaced by infrastructure designed for a lower service level.

3.5 Investments, operation and maintenance and resulting expenditure need

The assessment of expenditure needs is normally the most difficult part of establishing the technical, service and expenditure baseline. In case no concrete and complete data is available, the estimates have to be based on sound engineering judgement.

There are two components: The assessment of costs and related expenditure needs resulting from investments and their funding, and the assessment of costs and related expenditure needs arising from operation and maintenance.

3.5.1 Investment expenditure needs

The sources of data for the costing of investments required to achieve the targets will be existing reports, where available, existing investment plans provided by the water utility, etc.

In most cases, the water utilities will have investment plans for required rehabilitation and expansion. It is, however, important to assess such (existing) plans carefully in relation to the (revised) target.

In cases where no (reliable) investment plans are available, the technical team will have to assess investment levels based on sound engineering practice and taking the Technical Profile Summary as the entry point. Rough rules of thumb and reference to generic cost functions will do, at this stage.

3.5.2 Operation and maintenance

In the CEE, the expenditure need arising from daily operations can typically be assessed on the basis of information given in the accounts. Operation expenditures are typically paid cash or with normal trade credits, and the plants are typically operated as their design prescribes.

In the CIS, it may be difficult to obtain a good estimate of the proper expenditure needs arising from daily operations. Accounting information may be of very little value if expenditures are not paid in cash but via barter or another non-cash arrangement, or if the plants are not operated as their design prescribes, e.g. because cash constraints make it impossible to buy the necessary chemicals. In these cases, the estimated expenditure need has to be based on sound engineering judgement. Such engineering judgement may be supported by information from published benchmarking surveys[11].

The appropriate annual maintenance expenditure is typically calculated as a percentage share of the value of assets. At a stage during the preparation of this Toolkit, it was envisaged to include the asset value as an indicator to be used in the assessment of the maintenance expenditure requirements. Based on book and depreciated asset values, it was anticipated that the assessments of maintenance and possibly even repair costs could be estimated.

The key problem experienced – both in the CEE and CIS case studies - was, however, that neither the book value nor the depreciated values are reliable indicators of new or replacement asset values. There are many reasons for this state of affair, but the bottom line is that it makes no sense to base estimates of maintenance expenditure on the asset values provided in the accounts.

Care should also be exercised when relying on water utility maintenance and rehabilitation plans. It should be checked whether the indicated maintenance expenditure needs reflect the actual maintenance requirements, or rather the availability of maintenance funds.

Again, the estimated maintenance expenditure needs have to be based on sound engineering judgement. Such engineering judgement may be supported by information from published benchmarking surveys or from studies, e.g. feasibility studies from other utilities.

3.5.3 Cost considerations in determining tariff revenue needs

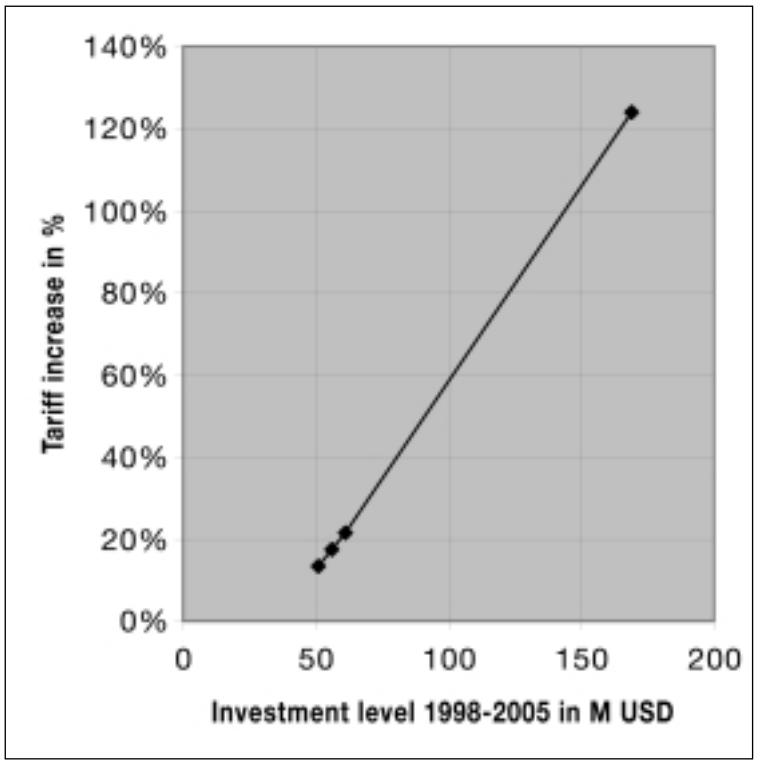
The tariff revenue needs depend on the O&M cost and the cost of the investment. With respect to O&M cost, it seems reasonable to assume that the annual costs will materialise as annual expenditure.

Regarding investment cost, the crudest method is to use an estimated annualised cost and assume that tariff revenues should finance the annual cost. One way of doing this is to use the actual outlays to service the loan repayment. If information on financing is available, it may be possible to establish a realistic profile of the expenditure which needs to be financed by tariff revenues.

At this stage - for use in the willingness to pay surveys – it is sufficiently accurate to state the expected tariff increases in intervals of, say +25%, +50% etc.

In some cases, existing reports provide easy conversion of investment levels to tariff increases, see example from Poznan in Figure 3.1 below.

Figure 3.1: Relationship between medium-term investments and resulting tariff increases, Poznan 1998 - 2005.



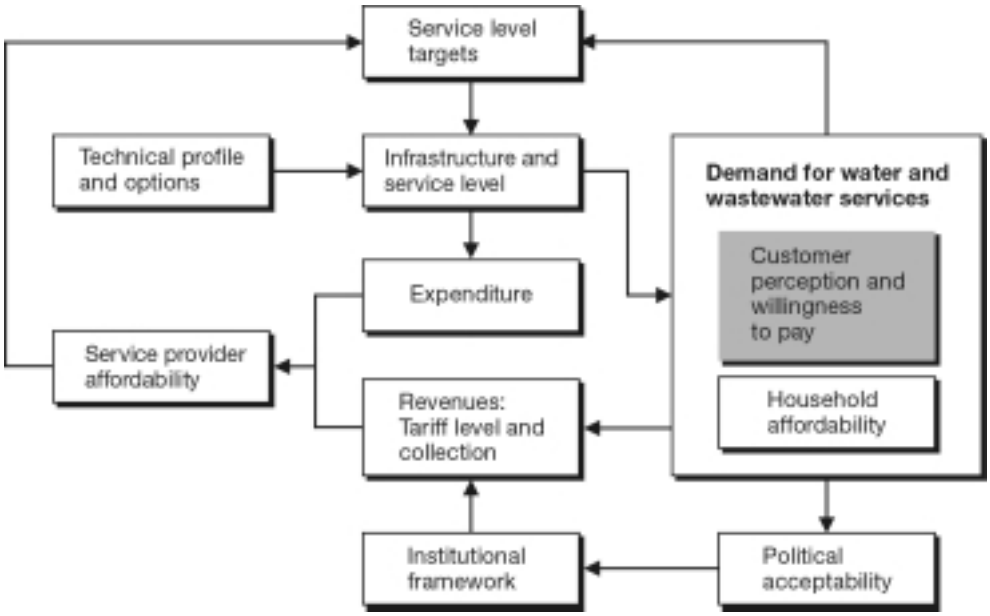
Source: Booz-Allen and Hamilton

A similar figure can be used in many situations. The figure will need some accompanying text describing the relationship between different investment levels and the service that can be achieved. Such a relationship may support the design of a proper willingness to pay survey.

In the case of the city of Poznan, a technical review has assessed that an investment level of approximately 50 million USD over the period 1998 - 2005 is required to maintain the current (1998) service level. An additional 40 - 50 million USD would be required to improve the effluent quality through the completion of a wastewater treatment plant. See appendix 13 for more details.

CHAPTER 4

CUSTOMER PERCEPTIONS, WILLINGNESS TO PAY AND DEMAND FOR WATER



4.1 Introduction

4.1.1 Purpose

This chapter and the following chapter have a joint **purpose** namely to provide guidance as to how to assess the demand for water and wastewater services. The demand for services is a function of relative prices, income and preferences of the customers.

The present chapter provides guidance as to methods to carry out an analysis of the households' willingness to pay for water services.

4.1.2 Target group and structure of chapter

The **target group** of this chapter is **consultants who are familiar with market research,** but who have not yet used advanced market research methods in the water services sector. While much information in this chapter may be of interest to policy makers, the main part has been written for their consultants / advisors. Policy makers may read Section 4.2 and skim the remaining sections.

Following a discussion in Section 4.2.1 of **why to use** these tools and **when to use** them, the text focuses on **how to do** market surveys and willingness to pay analysis within water and wastewater in the CEE and CIS countries. In Sections 4.5 and 4.6, we assume that the reader is familiar with market research methods[12], including the stated preference methodology suggested for use.

4.1.3 Approaches to willingness to pay surveys

There are a number of alternative approaches to willingness to pay surveys. We recommend a particular approach to assess the willingness of the consumer to pay for water and wastewater services in medium-sized and large municipalities in the CEE and CIS countries[13]. The following sections justify our recommendation and describe the recommended approach. They describe the

12 The reader interested in stated preference or conjoint methodologies is refered to Green, P., A. Krieger and Y. Wind: Thirty years of conjoint analysis: Reflections and Prospects. *Interfaces* **31**, pp. 56-73. 2001.

13 The tools could be used in developing countries as well. However, it would be necessary to take into account the fact that, in many cities in developing countries, a large share of the population is not connected to public water supply. Thus the study of willingness to pay would have to include considerations related to the cost of connection as well as the availability of competing sources of supply (street vendors).

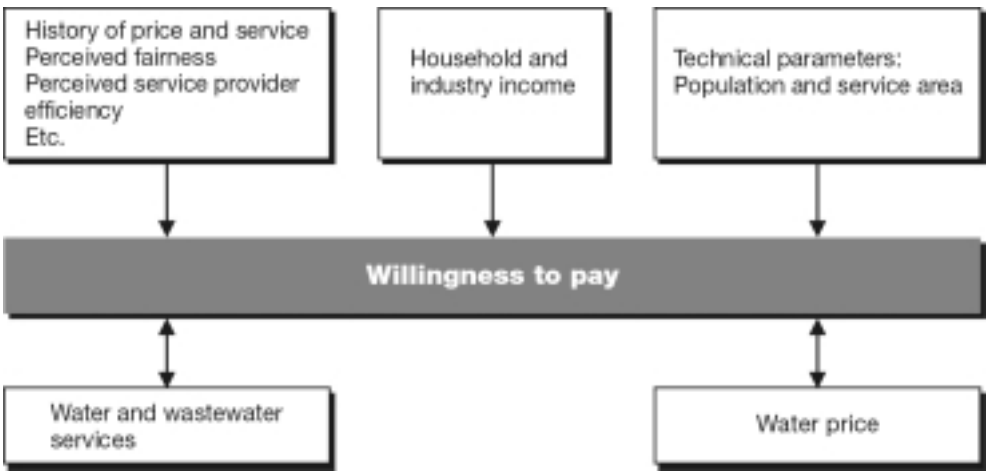
typical process and discuss the need to interface with experts and recipients. The suggested approach for small towns is given in CHAPTER 7.

The term "willingness to pay" describes the consumer's preferences in relation to changes in water and wastewater services and prices. The "willingness to pay" is the (expected) payment a user is willing to pay for a given service/product or a given change in service level or product attributes.

When improvements are introduced, willingness to pay reflects the level of increase in payment that leaves the consumer indifferent as to the situation before and after the change. Likewise, the willingness to pay to avoid a deterioration of the situation represents the compensation in payment which will be necessary to leave the consumer indifferent.

Willingness to pay for water and wastewater services is determined by a large number of factors including, but not limited to, the public perception of the quality of water and wastewater services. The main determinants of willingness to pay are illustrated in Figure 4.1

Figure 4.1: Determinants of willingness to pay for water and wastewater services



Sections 4.2-4.7 of this chapter deal with the methodology for quantifying willingness to pay for water and wastewater services. The methodology is sufficiently flexible to allow for all of the determinants to be included.

Section 4.8 briefly comments on how to deal with the estimation of price and income effects in relation to water and wastewater services.

4.2 Suggested approach, timing and resources

4.2.1 The selected approach – a brief justification

There are basically two types of data that can be collected and applied to assess willingness to pay:

- Revealed preference data
- Stated preference data

Revealed preference (RP) data is often preferred, when available, as it reflects observed behaviour. The traditional approach to demand assessment based on RP data is to assess the sensitivity of demand to changes in relative prices and income (elasticity). However, when faced with major infrastructure and service level decisions in the CEE or CIS water and wastewater services sector, this approach has limited value for a number of reasons.

First, for households the concept is only meaningful if the household is metered, thus giving a direct link between changes in demand and the price that the household pays for the service. Thus, the analysis cannot be made where households are charged according to norms.

Second, the traditional approach implies requirement for data based on observed behaviour. Ideally, panel data should be available and cover a period with major swings in relative prices and changes in income. Alternatively, a long time series for a period with unchanged institutions should be available. Such data is rarely available.

Third, the traditional time-series approach has a forecasting power only if the service will be essentially the same in the future as it has been in the past. However, the basic rationale of major infrastructure investments and/or a PPP arrangement is often to change the future service level compared to the past. Furthermore, customers do not choose between alternative water services as they choose between, say, alternative modes of transport. Also for this reason, the required data are unlikely to be available.

Fourth, the notion of total economic value recognises the fact that individuals may receive benefits from goods and services which may not be marketed. For example, water consumers may benefit from knowing that the wastewater treatment plant contributes to avoiding pollution. Assessment of the value of non-use benefits is often important for water services projects.

These considerations make methods based on hypothetical behaviour more appropriate when dealing with the valuation of water and wastewater services, in particular when future services are likely to differ from present services, or when non-use benefits are important.

There are two types of methods that are based on hypothetical behaviour and have traditionally been widely used:

- Contingent valuation
- Stated preference (or conjoint analysis)

In contingent valuation, consumers are asked to state their willingness to pay for a specific package of improved water services. This methodology can be useful if there is a specific package for the consumer to consider. However, there is a risk of consumers answering strategically, whereby respondents understate or overstate their valuation of the good or service in question.

The recommended approach to determine the willingness to pay for changes in the service level is a stated preference survey, also known as conjoint analysis. This is the most reliable method to assess the willingness to pay for future services or non-use benefits (e.g. avoiding pollution).

So far, stated preference methodologies have been used more in other sectors, such as transport infrastructure. This reflects the way in which the methodology was historically developed. In fact, the stated preference methodology is highly applicable for water services infrastructure. With this toolkit, we hope to achieve such wider usage.

We recommend the use of stated preference methodologies for the following reasons:

- Stated preference analysis is useful when a package of services is not pre-determined, and part of the aim of the market research is to investigate which services to provide.
- When using stated preference analysis, the risk of strategic answers is minimised as the consumers are asked to choose the preferred option among two or more alternatives. The suggested stated preference survey technique involves the trade-off between multi-dimensional choice pairs which makes it possible to find the optimal package of services for the consumer, and which makes strategic behaviour difficult to perform by the respondent.
- Stated preference is based on economic utility theory and has proven successful in market research. The case studies confirm its usefulness in the specific context of water and wastewater services in the CEE and the CIS countries.

The issue of assessing the sensitivity of demand to changes in prices (and income) is still a very important one. The financial viability of many water services projects is crucially dependent on sound assessment of how much water will be demanded (and sold) in the future. Traditionally, stated preference analysis does not directly provide a figure for the sensitivity of demand to changes in price and income.

We therefore suggest an enhanced approach to assess the future demand for water and wastewater services. We suggest to analyse affordability and willingness to pay separately and to carry out market surveys to assess the willingness to pay for water and wastewater services. The quantitative survey of willingness to pay may be designed to capture both willingness to pay for alternative services and the sensitivity of demand. An example hereof is given in Section 4.8.2. The consultant may also assess likely changes in water demand in response to specific combinations of future service levels, prices and incomes by combining analyses of affordability, and willingness to pay with a traditional assessment of demand elasticity based on historic data.

4.2.2 The stated preference approach – summary of process

The methods presented are interview-based surveys directed at users of water and wastewater services. The focus is on households, but the methods are also applicable for commercial customers (excluding industry) with some minor adaptations.

Specific data collection and questionnaire formats as well as typical output formats that have been tested and found useful during the case studies are presented in Appendices 4 to 7.

Text Box 2 provides a summary illustration of the process.

Text Box 2: The recommended steps in undertaking a willingness to pay survey

1. Engage local partner to: (Section 4.3)
   - provide interpreters for interviews, briefings etc.
   - provide translators to translate survey material
   - provide recruiters and market research interviewers to conduct field work
   - organise facilities such as rooms for interviews, briefings etc.
2. Ensure that the recipient is fully informed of the purpose and activities (Briefing note in appendix 6*)
3. Determine the issues of the survey (Section 4.4)
   - consider the range of issues (Section 4.4.1)
   - refer to terms of reference, undertake background research, and meet with relevant people (Section 4.4.2)
4. Undertake qualitative research (Section 4.5)
   - determine method – depths and/or group discussions (Section 4.5.1)
   - design sample and recruit respondents (Section 4.5.2)
   - design topic guide* (Section 4.5.3 and Appendix 4)
   - conduct interviews/ focus groups (Section 4.5.3)
   - debrief/prepare report (Section 4.5.4)
5. Undertake quantitative research (Section 4.6)
   - design sample (Section 4.6.1)
   - design questionnaire* (Section 4.6.2 and Appendix 5)
   - select stated preference variables and levels (Section 4.6.3)
   - translate survey materials (Section 4.6.4)
   - brief interviewers* (Section 4.6.5 and Appendix 6)
   - prepare pilot questionnaire (Section 4.6.6)
   - analyse pilot data and prepare pilot phase report (Section 4.6.7)
   - undertake main field work (Section 4.6.8)
   - undertake field work quality control* (Section 4.6.9 and Appendix 7)
   - code and data entry of questionnaires (Section 4.6.10)
   - undertake analysis and prepare report (Section 4.6.11)
6. Assess the willingness to pay among enterprises and public institutions (Section 4.7)
7. Assess price and income effects for households' demand for water (Section 4.8)
   - data and its collection (Section 4.8.1)
   - the households' likely response to a tariff increase (Section 4.8.2)

Note: Generic examples included in the appendices are marked by *

The analysis of price and income effects on water demand in Section 4.8 can be carried out separately if the total cost of water services to the consumer is related to the consumption, now or in the future. If this is not the case, this analysis should be omitted.

The traditional assessment of elasticity requires adequate data to be available and the results to be deemed relevant for assessment of the future demand for the services to be provided. However, even if adequate revealed preference data is not available, the consultant must consider the effects on water demand of price changes in the situation where the total cost of water services to the

consumer is related to the consumption. In these cases, the considerations may be based on the stated preference data collected and analysed.

Information to the recipient

During the process of the analysis, we recommend that the consultant keep in close contact with the recipient to make sure that the recipient is fully informed about the progress and, in particular, about the periods in which the recipient's customers are being interviewed. This is needed to avoid misunderstanding if representatives of the public contact the recipient to obtain information on the research. The recipient must ensure that information officers at the recipient's institution are fully informed about the progress and purpose of the study. The consultant can assist by preparing a short and concise briefing note to be used by information officers, cf. Appendix 11.

The recipient should also be asked to help by, for example, checking and commenting on survey questionnaires, introducing the research to the local population (thereby motivating them to participate in the survey) and providing facilities and logistical support for the consultancy team, for example offices and telephone lines.

4.2.3 Timing

The optimal timing of the willingness to pay analysis does not differ depending on whether the project is a PPP arrangement, such as a concession agreement, or a traditional investment project in a public utility.

The analysis is intended to feed into the determination of both future service and project design. Thus, in the traditional investment case, this is one of the steps undertaken **during the feasibility stage,** while in the PPP arrangement case, this is one of the steps undertaken as part of the preparation of the tender documents following the pre-feasibility stage.

For both a traditional investment project and a PPP arrangement, it is necessary to make a first estimate of the key service characteristics in order to be able to make a qualified analysis of customer perception and willingness to pay. This first estimate should include a first qualified "guesstimate" of the water balance in the city and an estimate of the "without project" scenario. Furthermore, analysed basic unit expenditure needs shall be available at this stage.

For **a traditional investment project,** it is important that the results are available before deciding on service level, project design and tariff setting.

For **a PPP agreement,** the optimal timing of the presentation of the results of this analysis is likely to be simultaneous with the announcement of the selected short list of firms invited to submit a bid for the lease, concession etc. The short-listed firms will find it useful to have an indication of the willingness to pay for various service levels in order to assess whether they will be able to match service level and tariff expectations.

The analysis may provide **additional spin-offs** for the municipality and/or the water utility. The results may provide useful information for designing a public awareness campaign, mobilising local political support etc.

4.2.4 Resources required

Typically, the willingness to pay and the demand analysis requires 14 to 18 calendar weeks as well as approximately 12 to 16 person weeks of resource input plus input from interviewers, translators, etc. It is therefore important to initiate the analysis as early in the process as possible.

Table 4.1: Resources required for the customer perception and willingness to pay tasks

	Person weeks	Calendar weeks
Determine the issues	2	2
Qualitative research	2	4
Quantitative research	8-10	8
- Design	2	2
- Pilot field work and analysis	2	1
- Main field work	1	1
- Analysis and reporting	3-5	4
Assessment of the households' likely responses to tariff increase[1]	2	4
Total	12-16	14-18

Note: (1) This analysis is only carried out if there are or will be incentives to reduce consumption. Otherwise, an increase in tariffs is not expected to influence the demand for water.

Disclaimer: The resource requirement has been estimated by COWI and is not necessarily endorsed by DEPA or EBRD.

4.3 Engagement of a local partner

Engaging a good local partner is essential to achieve efficient management of the survey programme. The local partner, who may be a market research organisation or a department at a local university or institute, will be able to deliver the following services:

- Provide interpreters for interviews, briefings etc. (if the study team does not include a native speaker, it is essential that the local partner includes interpreters who are also fluent in the international working language);
- Provide translators to translate survey material;
- Provide recruiters to recruit the respondents for the qualitative research;
- Provide market research interviewers to conduct field work; and
- Organise facilities such as rooms for in-depth interviews, groups and briefings; organise equipment such as overhead projectors for the briefing and provide other facilities such as maps (to mark/code household locations), photocopying, etc.

In addition, the local partner will, in some cases, be able to provide knowledge of local conditions which are of relevance to the study, such as details from other relevant research, information on appropriate income and age ranges, household types to be used in the questionnaire, information for sampling purposes, etc.

In some cases, the local partner will also be able to help with estimations, interpretation of results, etc., but a team experienced in stated preference analysis should be responsible for carrying out these tasks.

4.4 Issues in the survey

The issues to be treated in the analysis have to be determined. The focus could be on improving the quality of the water services or rather on avoiding a deterioration of present level of services. There is a range of issues that can influence the willingness to pay for the services and thereby the public acceptability of water and wastewater prices. The next section lists a range of issues that can be considered when conducting the analysis. The consultant should choose the most relevant ones for the research.

This is done by:
- Undertaking background research
- Meeting the relevant people

The ways to determine which issues to include in the survey are discussed in section 4.4.2.

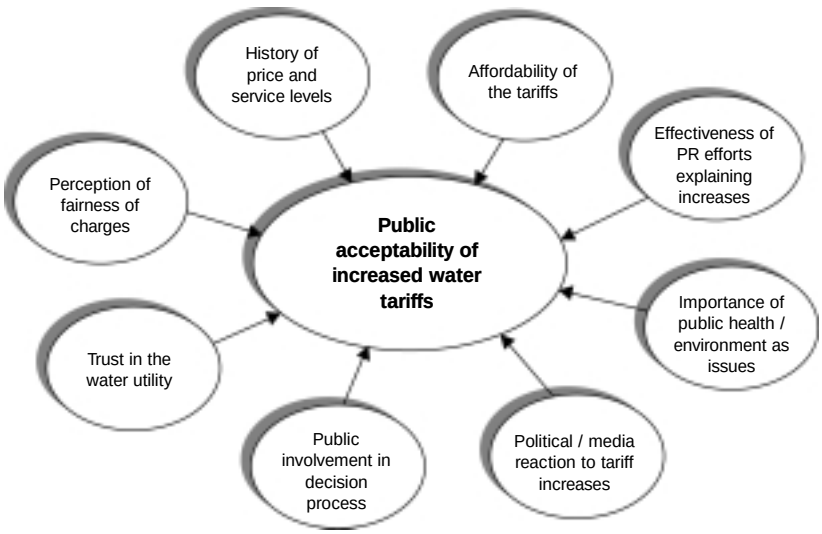
4.4.1 The range of issues

The main determinants of willingness to pay are:
- **Perceived quality** of water/wastewater service
- **Household income**
- **Current price** of water/wastewater

The perceived quality may differ from the "objective" quality. Here the emphasis is on perceived quality, and hence, the issues to be determined are, for instance, whether the focus should be on both drinking water and wastewater or rather on improving the healthiness of tap water.

The consumers' willingness to pay influences the public acceptability of water and wastewater prices. However, a range of other issues is also likely to have an impact, in this respect. These issues are illustrated in Figure 4.2.

Figure 4.2: Non-traditional issues influencing public acceptability of tariff increases



As it can be seen, there are a number of issues that may influence the public acceptability of tariff increases. Therefore, the research method must ensure that these issues are taken into account, where relevant. A number of procedures may be applied to ensure that the relevant issues are included in the research. These are described below. Of course, the qualitative research itself will also elicit valuable information on the relevant issues.

History of price and service levels

The history of price increases and service level may have a significant impact on the acceptability of future price increases. For example: Have previous price increases been justified with reference to service improvements? Has the utility delivered as promised?

If water services have previously been provided as a free (or heavily subsidised) public good then resistance to charges based on full cost recovery can be anticipated.

Has there been a history of successful public protests against price increases?

Affordability of the tariffs

This issue is discussed in depth in CHAPTER 5.

Effectiveness of public relations (PR)

Raising charges is never likely to be a popular measure and may become a major political issue. To convince the public of the need to increase charges, it is essential to develop a public relations strategy. This could involve the following elements:

- **Transparency of price setting.** Assuming that the increased charges are justifiable, then openness about the reasons for raising prices and structuring them in a particular way could gain public support. Conversely, a lack of transparency could lead to alienation of interested stakeholders, public suspicion and a lack of support.
- **Dissemination of information.** Linked to transparency is the need for wide dissemination of information to both the general public and groups involved in the policy process so that they can understand the reasons why the charges have been increased.
- **Professional PR activities** (advertising, press conferences, etc.).

Public awareness of environment and public health issues

This is a very basic but important point. If they are not major public concerns, higher charges for environmental and public health benefits are unlikely to be acceptable. This is particularly the case for wastewater treatment where the benefits of improved service are less tangible than in the case of water supply.

Political/media reaction to tariff increases

If the increased prices are turned into a campaigning issue by the media or by political parties, this will clearly have a major bearing on the reaction of the public to the charges. Furthermore, political parties can perform a leadership function, and political activists will often take a stance on political issues following the position of their chosen party. If their party is either for or opposed to the price increase, it is likely that many activists will follow this line.

The relationship between public acceptability and political acceptability is discussed in Sections 6.1 and 6.3.

Public involvement in the decision-making process

The interests of key stakeholders need to be taken into account if they are to be expected to support the price increases. In many cases, their views will visibly have to be taken into account in order to achieve "buy-in" to the proposed price increases (e.g. providing subsidies to socially disadvantaged groups in order to make the proposal politically acceptable).

Perceived utility efficiency

In most circumstances, the charges will be collected by the water utility which, in return, is expected to make the necessary investments in the water system. For this arrangement to be acceptable, there needs to be a degree of public trust in the utility – that the revenues collected will be used effectively and in the public interest. Different factors that could come into play are:

- The ownership of water utility:
  - Public ownership could be perceived as being inefficient compared with private operators' services, and local authority control may be viewed as being corrupt and/or politicised.
  - Private ownership could be viewed as being more efficient. But alternatively, high charges for a basic commodity such as water could be viewed as profiteering from the provision of an essential public service. Acceptability is likely to be linked to effective public regulation of the utility.
  - Negative reactions to private ownership can be magnified if the owner is foreign (the idea of increased payments resulting in increased profits for foreign shareholders).
- If the service provider is perceived as inefficient / wasteful / politically controlled, this is likely to undermine public support to paying increased charges.
- The effectiveness of consumer protection legislation, an independent regulator, and anti-monopoly authorities.

Perceived fairness

If charges are not perceived as being fair, they are unlikely to be perceived as acceptable. Different factors may influence the perception of fairness:

- In the CIS countries, it is common for certain users to provide cross-subsidies for other users. Under such circumstances, those providing the subsidies (e.g. private sector industry) may find it unacceptable that other consumers benefit from reduced rates (e.g. public sector institutions).
- If the charges do not take ability to pay into account, they will certainly be unacceptable to those who find the new charges unaffordable. This is also likely to provoke a negative reaction in those sections of society interested in social welfare and social justice.
- If the charges are calculated without taking into account the actual water use (as it is common throughout the CIS countries), it is possible to envisage a situation where a wasteful user is billed the same as a more economical neighbour who only uses a fraction of the amount consumed by his neighbour. Under such circumstances, acceptability could depend on the perceived fairness of the water use norms.
- If meters are being introduced to some consumers, only, a possible scenario would be for those with meters to reduce their water use (and therefore their bill). If the overall water charges are increased to compensate for this lost revenue, this might have a disproportionate effect on those without meters. They are likely to find such a situation unacceptable.
- If tariff levels are significantly higher than those in other municipalities, the reasons for such difference will need to be convincingly explained, or it could become a source of public dissatisfaction.
- Procedures for enforcement need to be considered. If non-payers are cut off from the water supply,

it could be viewed as socially unacceptable in relation to such an essential public utility. Alternatively, if enforcement is not perceived as being uniform (some customers are able to get away without paying), the acceptability of paying increased water charges is likely to be undermined.

4.4.2 Determining the issues

If the terms of reference are specific on certain issues, for example, defining precisely different segments to be analysed or defining which sort of changed/new/improved services to investigate, the willingness to pay for this should, of course, guide the consultant in determining the issues. If the TOR are more open-ended, the following approaches are useful to determine the issues.

Undertaking background research

The relevant issues can be determined by undertaking background research in order to understand:

- the realistic technical options/alternatives and, in particular, their impact on realistic service levels (for a discussion hereof, See CHAPTER 3);
- financial and administrative issues such as: billing, collection of payment, enforcement of collection of payment and other rules, principles and practices of how to measure water use, the financial standing of the utility etc.; and
- the socio-economic context, in particular income levels and distribution and types of households.

A wide range of material will typically be available which may help to determine the issues on which it is relevant for the stated preference analysis to focus. These may include:

- reports, statistics, working papers etc. giving general introduction to the utility;
- previous market research reports on water or other relevant areas (such as other utilities);
- reports, statistics, working papers on the (local) economy in the area of the study showing income, socio-economic data, etc.

Meeting the relevant people

Interfacing with experts within financing and engineering is necessary whether the willingness to pay and affordability analyses are carried out as stand-alone analyses or as part of a feasibility study. The experts can be permanent staff of the utility in question or consultants.

Discussions with engineers and financial experts are needed to gain an adequate understanding of the project context and the technical and financial operations of the water and wastewater utility.

Background information

The type of information that can be collected at this stage includes:

- Details of tariff structure – how are tariffs calculated? Is it a flat rate? How much is for water and how much for wastewater?
- Possible privileges and/or subsidies, etc.? Who qualifies?
- Procedures for collection of water bills. Are they part of a household bill that also includes rent etc.?
- Collection rate.
- Consequences for non-payers.
- Existence of meters or plans to install meters.
- Date of the last rise in water rates. Size of the last rise. Development in other key prices such as

those of utilities, rent, food, transport etc.
- Other relevant information such as investment plans, environmental issues, major incidents, etc.
- The state of the economy – inflation, growth, etc.

4.5 Qualitative research

Following the determination of the issues the qualitative research can be conducted. If it has been concluded that a key issue of interest is to avoid a deterioration of the present water services, the qualitative research uses this as its starting point.

Qualitative research comprises open but structured interviews or discussions with a sample of users with the purpose of:
- Determining the important factors as perceived by the users (healthiness of drinking water, taste, smell etc.), including checking that the factors already identified are relevant and identifying new factors of importance to the customers;
- For the key factors, e.g. healthiness of tap water, determining the likely ranges of willingness to pay to be used later for the quantitative research (see Section 4.6). An important point here is to ask respondents to bring their last water bill, as this will facilitate discussions on willingness to pay;
- Determining the language and vocabulary used and understood by the re-spondents for later formulation of questionnaires; and
- Identifying other issues of relevance not identified during the background research.

Qualitative research is a key part of the willingness to pay methodology. It comprises the first contacts made with the users, and it helps define the issues being analysed through the quantitative research.

An important factor or issue that is not identified in the qualitative research is likely to remain un-discovered and hence constitute a major weakness of the whole method.

4.5.1 Determine the method – in-depth and focus group discussions

There are two main formats for qualitative research: in-depth interviews and focus group discussions.
- In-depth interviews are face-to-face and conducted with respondents in a suitable, comfortable environment. One or two interviewers interview each respondent with consecutive translation by a professional interpreter. Each interview lasts between 30 and 60 minutes. A programme of 6-12 interviews is required. The number of interviews required could be higher if there are different groups with different attitudes in the area, or if the level of service provided differs substantially among consumers in the area.
- A focus group consists of a group of typically eight respondents. The members of the group should represent water users in general. If more than one focus group is established then there is an opportunity for segmenting the groups (e.g. one focus group of men and one of women) to identify whether there are differences between the segments. Obviously, awareness questions can only be tested in a focus group by including, for example, a small questionnaire to be filled in individually by group members. Focus group sessions typically last approximately 2 hours.

Focus groups have the following advantages compared to in-depth interviews:
- respondents can inspire each other;
- respondents also act as interviewers when asking each other questions;

- respondents might feel less “interrogated”; and
- it takes less time per respondent included in the research.

Some disadvantages are:
- risk of side-tracking the discussions;
- risk of very dominant/reluctant group members;
- difficulty of testing the awareness of group members since they educate others;
- the general demands on the moderator are greater than those on experts undertaking in-depth interviews;
- risk of group pressure, hiding the points of view of individual respondents; and
- some personal questions are more difficult to discuss in a focus group e.g. income.

For both in-depth interviews and focus groups, a financial incentive for participation should be provided (equivalent to approximately two hours' wage income or 2-15 EURO, the lower end being relevant in the CIS, the higher end in CEE).

Both the in-depth interviews and the focus groups use a topic guide (see Section 4.5.3 below). This is prepared using relevant background information.

Recommendation: A mix of in-depth interviews and focus group discussions provides the best approach for the qualitative research. For example, the focus group can provide information that cannot be elicited in the in-depth interviews and vice versa.

Text Box 3: Focus group in Kaliningrad, Russia

In the focus group, it was learnt that some respondents did not pay their bills on time (often paid many months in arrears). The in-depth interviews included a question asking whether people paid their water bill. The response was "yes". So, the respondents who said they paid their bills did not necessarily mean that they paid the most recent bill.

Another example is the storage of water. In the focus group, one person mentioned that they kept a week’s supply of water from the well. Then most said they also kept reserves of filtered water or water from a well.

There are two options in relation to the moderation of the focus groups:
- Moderated by a member of the research team with consecutive translation of questions and simultaneous translation of responses
  or
- Moderated by a local expert with the research team following the discussion through consecutive translation of questions and answers.

Both options have advantages and disadvantages. The former puts the research team more in control and allows issues to be probed further, if necessary, but it seems to inhibit some free-flowing discussion because of the breaks due to translation.

The latter provides for a much more free-flowing discussion, although we would recommend that the group be taped (sound only or video and sound) so that the translation does not take place in the

14 In the CEE countries and the CIS, many water utilities supply cold water only, while the district heating company supplies hot water (for both heating and other uses). In this situation, it may be relevant to focus on cold water only. This has been the case for all our case study municipalities.

same room. This is because the translation can affect the group dynamics, with some participants talking to the study team and not the other group members. Also, this approach would work much better if the moderator is an experienced group moderator and well versed in the local water issues.

Text Box 4: Quantitative research in Brno, Poznan and Kaliningrad

Brno: 12 in-depth interviews were carried out.

Poznan: 6 in-depth interviews and one focus group discussion were carried out. A member of the consultant is team moderated the focus group. Eight customers participated in the focus group discussion.

Kaliningrad: 6 in-depth interviews and one focus group discussion were carried out. A local person not experienced in moderating focus groups moderated the group. Eight customers participated in the focus group discussion.

4.5.2 Design sample and recruit respondents

For qualitative research only a small sample is required. It would typically cover representatives of the major segments of the relevant users.

For water research, "relevant users" include the entire population in the geographical area in question. The sample for qualitative research should be chosen in such a way that it can be expected to reflect all possible service issues. The sample should not reflect the proportions in the population.

It is our experience that in-depth interviews with 6-12 customers and one focus group discussion are sufficient.

Text Box 5: Characteristics of sample for in-depth interviews and focus groups in Poznan, Poland

In Poznan, the respondents were stopped in the street and asked to participate in the research. The sampling for the qualitative research was described as follows. "The people selected for interviews and the focus group should include both young and older people, they should represent broadly different housing and family characteristics, and they should have no links to the Poznan Water Utility".

4.5.3 Topic guide and conducting qualitative interviews

The content of the topic guide will depend on the local circumstances as elicited from the terms of reference, background research and discussion with relevant people as described in Section 4.4. The topic areas are likely to include most or all of the following areas:

- Introduction to the survey
- Respondent characteristics
- (Cold) water supply[14]
- Assessment of present (cold) water service
- Assessment of present wastewater service
- Political issues
- Attitudes to the water company
- Payment of water bills
- Willingness to pay.

A generic example of a topic guide is included in Appendix 4.

The format of the topic guide should allow plenty of room to write down responses.

The nature of the qualitative research process means that the topic guide is used as a structured guide to the process. It is important that the topic guide is used as a launch pad for enquiry rather than a structured questionnaire. The interviewer should explore further areas which reveal themselves to be of interest.

Not all topics in the guide are necessarily covered, and also, those covered may occur in a different order than that shown in the guide.

Text Box 6: Evolution of the topic guide in Brno, the Czech Republic
During one of the in-depth interviews, a respondent mentioned that his household used bottled water for cooking. Later interviews, therefore, probed the use of bottled water, which turned out to be very high.

4.5.4 Debrief/prepare report

Following the qualitative research, the consultancy team will meet to discuss the findings of the research. This process involves going through the written notes from all the interviews/focus group discussions, topic by topic to assess the importance or weight of opinion for each topic area.
A report is then prepared based on the results of the qualitative research.

4.6 Quantitative research

The quantitative research is designed using the findings of the qualitative research, and will provide quantitative measures of willingness to pay as well as other aspects of interest. The quantitative research includes the following steps:

- Design of the sample
- Design of the questionnaire
- Design of stated preference games
- Translation of survey materials
- Briefing of interviewers
- Pilot phase of the field work
- Pilot phase report
- Main phase of the field work
- Field work quality control
- Coding of questionnaires and data entry into database
- Data analysis
- Reporting

Each of the steps is discussed in detail below, and the text includes examples from the case studies.

4.6.1 Design of the sample

The sampling methodology is critical since the results must be representative of the population in order to be valid.

Ideally, a stratified random sample using electoral roll data would be used. In practice, the budget and/or availability of appropriate records may not allow such an approach. Therefore, a sampling method must be designed which, as far as possible, results in a representative sample.

Text Box 7: Sampling methodologies. Examples from Brno, Poznan, and Kaliningrad

In the case studies, three approaches were used.
In **Brno,** the respondents were chosen on a "1 in n" basis from the telephone book.
In **Poznan** the respondents were recruited in households using a random walk process, then specific flats were chosen at random (with the floor number chosen at random).
The sample in **Kaliningrad** was chosen from a consumer panel used for an expenditure survey. The panel itself was rigorously sampled on a stratified basis which ensured that the respondents for the stated preference were representative of the population in Kaliningrad.

Regardless of the method applied, special care should be taken to ensure that the sample is randomly chosen and that it is appropriate. For example, in a region with a low level of telephone ownership, phoning respondents would not be appropriate.

If the aim is to interview a representative sample of the inhabitants of the city, extensive and recent data on inhabitants has to be available.

In practice, a random sampling approach is most appropriate when data on inhabitants is not available or of poor quality.

Whatever the sampling approach, a call-back regime should be instituted so that the sample does not over-represent those who are more often at home (typically the elderly and the unemployed). Such a call-back regime means that, if there is no one at the sampled location, you call back up to three times at different times and days.

Finally, the approach should ensure that the person responsible for paying the water bill is interviewed.

4.6.2 Design of the questionnaire

The questionnaire can be divided into two parts: a general part on the socio-economic variables, water usage and attitudes towards the present service levels, and another part including the stated preference questions. The two parts of the questionnaire are described below. A generic questionnaire with a wide range of questions is included in Appendix 5.

General part of the questionnaire

The questionnaire is designed on the basis of the information gathered in the background research and the qualitative work.

The questionnaire should include:

- Assessment of existing water and wastewater services
- Attitudes towards water and wastewater services
- Importance of improvements in water and wastewater services
- Payment of water bills
- Respondent characteristics
- Other subjects of interest, e.g. attitudes towards the water company, political attitudes, attitude towards recycling.

The questionnaire may also include questions on expenditure, if income data is deemed unlikely to be of great validity (for instance because public sector employees have not been paid for a considerable amount of time, and/or there is a significant grey economy).

Some questions should be asked with respect to different seasons. For example, bottled water usage in a typical summer month and a typical winter month.

Many subjects can be covered by a questionnaire. However, a selection has to be made in order to keep the length of an interview acceptable to the respondent (20 to 30 minutes). It should be borne in mind that the stated preference part of the questionnaire will take about 10 minutes.

Identification of stated preference variables and levels

A list of possible improvements in the water services will have been identified in the background research and the qualitative research. Probably, it will not be possible to accommodate all options in the stated preference game so the most appropriate ones should be selected.

The possible changes in service levels can then be divided into two or three groups. The most important services are included in a stated preference game as described below.

The other, less important changes in service levels can be included in importance-rated questions in the questionnaire in order to obtain information on the respondents' evaluation of other services. If the changes in service levels from the stated preference are also included in the importance ratings, then a link can be made between the stated preference 'willingness to pay' values and the other values (although this is not a statistically robust approach).

Some possible changes in service levels may be assessed to be of minor relevance/importance and, therefore, not included in the questionnaire at all.

4.6.3 Design of stated preference game

This section describes the design of a stated preference game. We would recommend that just one stated preference game be undertaken. This is to ensure that the questionnaire does not become too long, and that the task is not too complex for the respondent. It is technically possibly to include more than one stated preference game and, with a link variable, to assess the willingness to pay for a large number of variables.

15 This and the following text boxes related to the stated preference game have all been taken from the same case study (Kaliningrad) to give a better flow in the un-derstanding of the examples.

The willingness to pay for water service is examined using stated preference techniques. A stated preference game consists of a number of factors – normally three or four. One of these factors is the tariff, and the rest are service factors of interest, e.g.

- Water quality
- Smell
- Colour/clear water
- Pressure
- Hours of water supply per day
- Standard of wastewater treatment.

The choice of the service factors depends on the current standard of the supply, the feasible improvements and consumer requirements. Each of the factors has two, three or four levels, each of which describes a certain service level.

An example of a choice task in the stated preference game is presented in Text Box 8.[15]
From the choices that the customers make, it is possible to infer the willingness to pay for each of the changes included in the choice task.

There is a limit to the number of choices a respondent can undertake before losing interest. As a rule of thumb, we recommend that eight choice tasks be presented to each of the respondents. Eight choice tasks are sufficient to estimate a model, and adding more choice tasks to the questionnaire often does not provide more information as there is a fatigue effect making respondents answer randomly to the last questions. The number of choices should be tested in the pilot interviews.

Text Box 8: Stated preference game choice task, Kaliningrad, Russia

Here, the respondent must decide whether she prefers A) to pay 50% more to have water that is always safe to drink, with no smell at all, and supplied 24 hours a day with good pressure, or B) to have water as now and only pay 10% more. If water quality and supply are important issues to the respondent, and there is an ability to pay, A) may be preferred. If money saving is important to the respondent and/or there is little ability to pay, B) may be preferred.

A	or	B
WATER QUALITY: always safe to drink directly from the tap		WATER QUALITY: as now
SMELL: no smell at all		SMELL: as now
SUPPLY AND PRESSURE: water supplied 24 hours a day and always good pressure.		SUPPLY AND PRESSURE: as now
COST: plus 50%		COST: plus 10%

16 A description of the possibilities in SAS can be found on http://ftp.sas.com/techsup/download/technote/ts650/ts650.pdf.

Text Box 9: Factors and levels in a stated preference game, Kaliningrad

Factor	Levels
Water quality	as now
	always safe to drink directly from the tap
Smell of cold water	as now
	no smell at all
Supply and pressure	as now
	24-hour supply and pressure as now
	24-hour supply and always good pressure
Cost	as now
	plus 10%
	plus 25%
	plus 50%

The actual choice pairs presented to the respondent should be chosen in such a way that all parameters can be estimated without multicollinearity. This is achieved by applying an orthogonal design. This means that the various combinations of the factors and levels are sufficiently varied so that the willingness to pay can be estimated for all service changes. This is done by using the appropriate software like SAS[16]. Other software packages include Speed/Mint from Hague Consulting Group (www.hcg.nl) and Sawtooth Software's SMRT (www.sawtooth.com).

It is recommended not to include trivial choice tasks where one alternative dominates the other, e.g. where the left-hand side describes an improved situation with improved water services at a lower tariff, and the right-hand side describes the present situation.

4.6.4 Translation of survey materials

The questionnaire and briefing notes for interviewers should be translated into the language of the country in which the survey is conducted. This is a very important part of the process. High quality translation is required, and ideally the translation should be checked by a third party. The nature of a questionnaire (with some words used in isolation to describe issues, for example: colour of water, etc.) means that there is more room for misinterpretation than in prose. Also, there may be cultural differences in the use of language.

Text Box 10: Cultural differences: Quality rating in Brno and Poznan

In Brno and Poznan, the study team found that the rating scale 'very good' through to 'very poor' could not be directly translated to the local languages. Therefore, the rating scale was translated to a wording that made sense to the local inhabitants (in English the rating scale still translates to 'very good',..., 'very poor').

Therefore, the translation of the questionnaire should be discussed with the translators, allowing them an opportunity to raise any relevant issues.

Furthermore, the design and levels of the stated preference games should be thoroughly checked so that design and levels are exactly the same in the English language version and in the local language.

4.6.5 Briefing of interviewers

The interviewers for the pilot and the main phases will need to be briefed face to face. The briefing is required in order to:

- Explain the background of the research;
- Describe the tasks they are to perform in terms of:
  - Sampling including how to choose appropriate respondents, what to do in case of non-response, call backs procedures, etc.
  - Recruitment questionnaire, if applicable (to register appointments for later interviews)
  - How to fill in the questionnaire including explanation of probes (asking if there are any other reasons), jumps ("go to" instructions from one question to another), what to do if responses cannot be coded etc.
  - Manner and approach with respondents.
  - Handing out incentives (if applicable).
  - Return of questionnaires etc.
- Go through the questionnaire, question by question, so that they understand exactly what each question means. Answer any questions that may arise;
- Explain the stated preference game;
- Explain back-check procedures.

The briefing session will last about 3-4 hours. There should be an interpreter present to translate the briefing to the interviewers.

An overhead projector should be used (if possible) so that the questionnaire can be projected to facilitate the detailed explanation of the questionnaire.

After the briefing on the questionnaire, the interviewers should split up into pairs and interview each other, so that each interviewer has undertaken an interview and been interviewed. The completed questionnaires will be checked by the consultant to ensure that the questionnaire has been completed properly (e.g. answers being circled, routings ('go to' instructions) being followed) and that the stated preference games have been answered 'correctly'. The latter issue includes assessing whether the respondent has understood the task and checking that there is internal logic in the choices, whether there is consistency in responses etc.

If the consultant perceives any lack of understanding, then she will explain again to the interviewer how the task should be done, and if appropriate, inform the whole interview team.

A generic set of briefing notes is included in Appendix 6.

4.6.6 Pilot phase of the field work

The pilot survey is used to test the methodology as well as the design of the questionnaire and the stated preference games. Therefore, the method used in the main survey should be adopted in the pilot as well. A full briefing session should be undertaken (as described in Section 4.6.5). The length of time required to conduct the interview should also be recorded.

A pilot phase comprising 25 to 30 interviews is considered sufficient.

A debrief session should be conducted by the consultant with the interviewers and an interpreter. This will establish at first hand whether there are problems with the method or the questionnaire. It will also allow the consultant to check that the questionnaires have been filled in correctly.

The data from the pilot phase should then be coded, the data entered in a database and the results analysed. The answers are checked in order to ensure that all questions are well understood, and that the stated preference game is working well. Checking the stated preference games includes assessing if all parameters are relevant to the consumers, and if the levels of e.g. cost are perceived to be within realistic limits. For example, if respondents always choose alternatives with the lowest cost in the stated preference choices, the cost levels should be adjusted downward.

4.6.7 Pilot phase report

In the pilot phase report, special emphasis should be placed on checking that the stated preference games worked well. It may be necessary to make changes to the stated preference games if, for example, the levels of the tariff are too high or the respondents do not understand a certain service level.

The analysis of the stated preference game in the pilot phase report should include answers to the following:

- Do all the stated preference choice tasks work well?
- Do respondents trade off between the factors?
- Do the parameters have the expected sign, i.e. negative for cost and positive for service improvements?

If a choice task is working well, there should be respondents that choose both alternatives for any given choice pair. If all respondents choose the same alternative, the choice task might be too obvious, and the design should be changed.

Text Box 11: Do the stated preference choice tasks work well?

An example of the pilot analysis undertaken in Kaliningrad is given in the table below. Here, the respondents were given eight choice tasks, numbered 1 - 8. All respondents agree that A is preferred to B in choice task 3. Thus, the information from this choice pair will be poor, as the choice is too obvious.

Chosen alternatives by choice number

Choice task no.	A is chosen	B is chosen
1	11	14
2	4	21
3	25	0
4	24	1
5	1	24
6	21	4
7	12	13
8	20	5

This means that e.g. choice task 3 is not giving much extra information. In order to examine the cause, it is necessary to analyse the actual choice pair, cf. Text Box, 12.

Second, the pilot analysis should reveal whether one factor dominates the choices so that the respondents do not trade off on other factors. This might occur if the tariff levels include levels which are so high that respondents choose the cheapest alternative in all choice tasks.

Text Box 12: Do the trade-offs work well?

The table below gives the number of respondent who chose the 'better' alternative for each factor. Here Cost is a dominating factor as most of the 25 respondents in the pilot choose the 'better' (i.e. lowest cost) alternative in most of the games. Choice no. 1 is the one where most respondents chose the more expensive alternative (cost did not vary in choice no. 7).

Pilot: Number of respondents by choice task no. and chosen factors: Cost, water quality, smell and supply and pressure

Choice task no.	Cost	Water quality	Smell	Supply and pressure
1	14	11	14	0
2	21	4	0	0
3	25	0	0	0
4	24	1	24	1
5	24	24	0	1
6	21	4	4	21
7	0	12	13	13
8	20	5	0	20

Because these results indicated that cost is very important and, in fact, dominating in the choice pairs, the increases in cost were reduced. In the main round, this lead to responses where the improved and expensive alternative was preferred more often, cf. task 4, 5, 7 in the table below

Final: Number of respondents by choice task no. and chosen factors: Cost, water quality, smell and supply and pressure

Choice task no.	Cost	Water quality	Smell	Supply and pressure
1	81	7	61	53
2	81	60	22	37
3	97	25	0	19
4	52	30	50	61
5	51	93	35	35
6	89	38	2	27
7	40	72	29	23
8	89	52	47	57

17 In the case studies no new factors were introduced after the pilot analysis, and hence it was only conducted once for each study. Downward changes in the level of cost were made in the case studies in Kaliningrad and Brno.

18 In each of the case studies, 25 pilot interviews and 125 main phase interviews were conducted.

Finally, the parameters of a logit model are estimated, cf. Appendix 9. While 25 - 30 respondents are not sufficient to obtain a reasonable model, estimation on 25 - 30 respondents can reveal if the expected signs are obtained (negative for cost and positive for improvements in water service or quality).

Adjustment of the questionnaire

On the basis of the analysis of the results of the pilot phase, changes should be made in the questionnaire.

If major changes are necessary, e.g. if the pilot analysis shows that one or more factors should be replaced, another pilot analysis should be undertaken[17].

4.6.8 Main phase of the field work

The number of respondents interviewed in the main phase depends on the intended segmentation of the households. The main phase should include at least 125 respondents, allowing 150 respondents for the analysis[18]. This enables analysis of two segments, e.g. poor and rich. If more segmentation is needed, at least 75 respondents per extra segment should be interviewed. The number of observations needed is based on experience with stated preference surveys and differs according to the type of problem and method applied.

In general, the more observations the better, as the variance of the parameter estimates declines as the number of observations increases. The interviewing costs are relatively low in the CEE and CIS countries, implying that a higher number of respondents can be considered in order to get more robust results and more possibilities of analysis.

A full briefing, preferably with (or at least including) the team that undertook the pilot analysis, should be undertaken.

Interviewers should be provided with recruitment questionnaires (if applicable), main questionnaires, showcards, sampling details (such as maps, lists of respondents), incentives (if applicable) and briefing notes.

A strict time schedule for all interviews to be completed should be set. Questionnaires should be returned frequently during the field work period in order to check if the questionnaires are completed correctly. This is to ensure that none of the interviewers are making mistakes.

4.6.9 Field work quality control

A back-checking procedure is important to ensure the quality of results and, of course, to ensure that the questionnaires are genuine (and not filled in by the interviewers at home). A sample of 10% should be back-checked and, therefore, it is important to make sure that addresses or phone numbers are provided for the respondents so that it is possible to call them back. If an interviewer does not fill in addresses or phone numbers, then the survey team should consider withholding his/her payment until it can be made sure that the interviews actually took place.

The back-checking questionnaire should include questions that can be verified against the answers from the questionnaire. Furthermore, the back-checking questionnaire should include questions on the manner and length of the interview and whether an incentive was paid (if relevant).

A generic back-checking questionnaire is included in Appendix 7.

4.6.10 Coding of questions and data entry into database

The local partner should code the data into an agreed format. In order to avoid misunderstandings and errors in the coding, a spreadsheet should be prepared by the consultants which includes all the questions in the questionnaire along the top axis, with each questionnaire to be entered as a row.

4.6.11 Data analysis

Checking the data

The data should be checked for consistency. An immediate check of the data is an examination of the minimum and maximum for all variables in the questionnaire. This can easily be done in a database program.

Result of the questionnaire

If only a few minor changes were made to the pilot questionnaire, both the data from the pilot phase and that of the final questionnaire can be included in the statistical analysis. However, where questions differ in the two versions, the results from the pilot phase should be excluded.

The stated preference data is analysed by applying advanced statistical tools. A Logit model is estimated. Before estimating the model, a set of a priori hypotheses are described and tested in the model. Examples of such a priori hypotheses are:

- consumers with a higher income have a higher willingness to pay;
- only consumers living on the 4th floor or above are more willing to pay for a higher water pressure than consumers living on the 1st floor.

The model also allows for different willingness to pay levels for consumers with different characteristics, e.g. age. However, all effects in the model must have a clear interpretation.

Estimation of a utility function

From the answers of the stated preference questions, a utility function can be estimated. The utility function evaluates the alternatives by tariff and service characteristics.

The theoretical approach to the estimation of the willingness to pay higher tariffs is that of microeconomic consumer theory. In consumer theory, individual consumers choose consumption bundles to maximise utility. In stated preference games, the respondent is asked to choose an alternative between two alternatives, A and B, so this is a discrete choice. Letting U represent the utility function, respondent i will choose the alternative that implies the highest utility:

$$U\left(x_{1i},x_{2i},..,x_{ki}\right)=\max\left[U\left(x_{1i}^{A},x_{2i}^{A},..,x_{ki}^{A}\right),U_{i}\left(x_{1i}^{B},x_{2i}^{B},..,x_{ki}^{B}\right)\right]$$

The alternatives are described by a number of attributes, x_1, x_2,..,x_k, and these attributes are different for each respondent and each choice. The choice of the consumer reveals the consumer's preferences among the alternatives.

A probability model is used in order to allow for uncertainty. The probabilistic model is used in order to be able to allow effects of unobserved variation among the respondents and to take pure random choices into account as well as errors in measurement or incorrect information.

The model is estimated by maximum likelihood. This estimation method gives unbiased and efficient estimates. The method is discussed further in Appendix 9, and an example of the model estimated is given in Text Box 13.

Text Box 13: Estimated utility function, Kaliningrad

For the Kaliningrad case study, the estimated utility function was:

$$P_i(A) = \Lambda\left[\beta_{Trariff(lowincome)} Tariff_i + \beta_{Tariff(highincome)} Tariff_i + \beta_{Safe(age18-44)} Safe\ to\ Drink_i + \beta_{Safe(age45-54)} Safe\ to\ Drink_i + \beta_{Safe(age55-)} Safe\ to\ Drink_i + \beta_{No\ smell} No\ Smell_i + \beta_{24\ hours} 24\ hours\ Supply_i + \beta_{Pressure} Good\ Pressure_i\right]$$

where the $P_i(A)$ is the probability of respondent *i* choosing *A* instead of *B*. Λ is the cumulative logistic function, and the ß's are the parameters to be estimated. Finally, the variables in the formula represent the difference between the values of alternative A and alternative B, e.g. $Tariff_i = Tariff_i^A - Tariff_i^B$.

For the Kaliningrad case study, the importance of the price differs between consumers with high income and consumers with low income. Therefore, two different parameters where estimated. Naturally, consumers are expected to prefer lower tariffs to higher tariffs so the signs of both $ß_{Tariff\ (low\ income)}$ and $ß_{Tariff\ (high\ income)}$ are expected to be negative. Furthermore, it is expected that the consumers with a low income dislike higher tariffs more than consumers in the high income group, and hence it is expected that $ß_{Tariff\ (low\ income)} < ß_{Tariff\ (high\ income)}$.

Consumers in different age groups have different evaluations of the importance of the water being always safe to drink. Therefore, different parameters for three age groups have been included in the model. There is no a *priori* expectation as to which age group has the highest willingness to pay for safe drinking water.

The three remaining parameters estimated in the model do not vary for different socio-economic groups. However, 24-hour supply is only a relevant improvement for consumers without all day supply.

Results of the stated preference games

The estimated parameters are evaluated with standard statistical tools and common sense. The t-statistic is used to test if a parameter is significantly different from zero – this is the case when the t-statistic is greater than 1.645 for a single sided test and 1.96 for a double sided test.

Text Box 14: Estimation results for Kaliningrad

	Tariff		Water safe to drink					
	low income	high income	Age 18-44	Age 44-54	Age 55+	No smell	24 hours supply	Always good presure
Estimate	-8.825	-5.941	1.636	1.273	0.829	0.191	0.507	0.388
t-ratio	-9.2	-9.0	8.9	6.0	5.0	1.6	3.7	2.5

Calculation of the willingness to pay

The willingness to pay is calculated from the parameter values. This is done by dividing the parameter for the service level(s) of interest by the tariff parameter. By this method, the value of a service level is measured in the same units as the tariff.

$$WTP = \frac{Parameter\ for\ the\ service\ level\ of\ interest}{-Parameter\ for\ the\ tariff}$$

Text Box 15: Calculation of willingness to pay, Kaliningrad

In the case study in Kaliningrad, the willingness to pay extra for water always being safe to drink among low-income consumers between 18 and 44 years of age was:

$$WTP = \frac{1.636}{8.825} = 0.19 = 19\%$$

The tariff is measured in percentage changes in the current tariff, so the result is that this group is willing to accept a tariff increase of 19% to have tap water that is always safe to drink.

Non-additivity of willingness to pay results

It is important to note that the results are not additive. Thus, the analyst may conclude that the willingness to pay extra for water always being safe to drink among low-income consumers was 19%. Similarly, the analyst may conclude that the willingness to pay extra for water not having any smell among low-income consumers was:

$$WTP = \frac{0.191}{8.825} = 0.02 = 2\%$$

However, it cannot be concluded that the willingness to pay extra for water always being safe to drink and not having any smell is 21%.

4.6.12 Reporting

A full report should be prepared. As a minimum, it should include:

- Description of the method including sampling, recruitment and back-check procedures.
- Details of the pilot analysis.
- Results of the market research.
- Results of the stated preference research.
- Examples of the survey material.

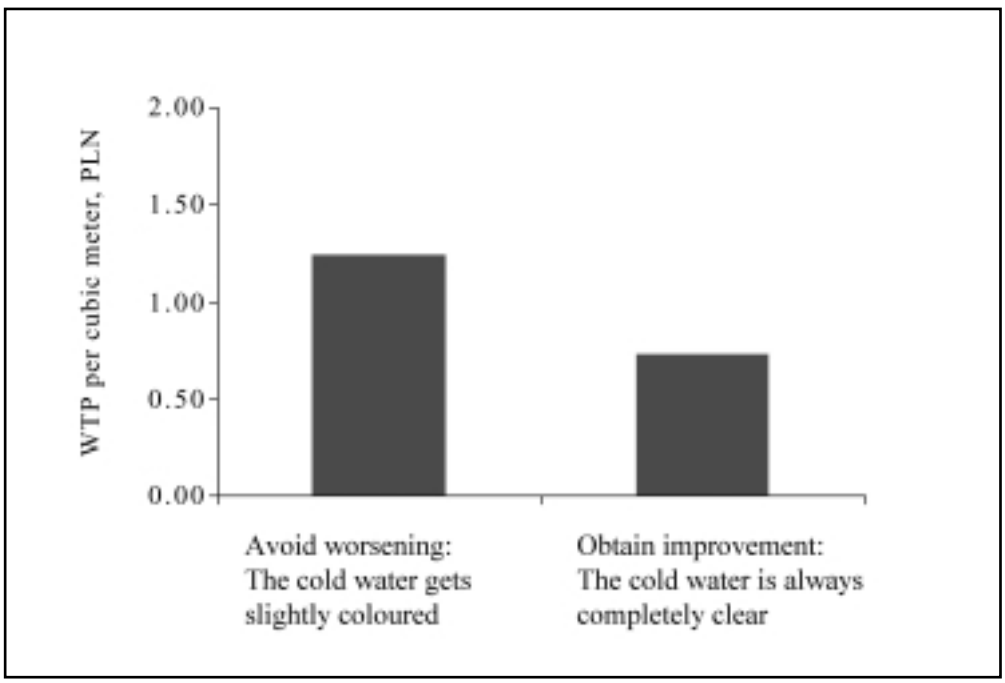
When making the final analysis and preparing the report, it is important to make sure that the results are presented in a way which will allow the results to be used when decisions are made on investments leading to changes in service levels. It is important to focus on results and their uncertainty. Due to the relatively complicated estimations and methods applied, extra care is needed in presenting the results in an easy-to-read fashion supplemented with graphical illustrations.

Furthermore, it will often be very useful to present both results and suggested policy guidelines in the reporting.

The graphical illustration (Figure 4.3) from the Poznan case study shows the willingness to pay for, respectively:

- Moving from the current situation to a situation with always clear water; and
- To avoid moving from the current situation to a situation with "slightly coloured" water.

Figure 4.3: Willingness to pay illustration, Poznan



Note: The data is weighted by the age and gender distribution in the Poznan urban region, census 1996.

The interpretation of the figure concludes that the consumers are willing to pay a maximum of 1.20 PLN extra per cubic meter to avoid that the water becoming slightly coloured. That is, they prefer that the water becomes slightly coloured to a price increase of more than 1.20 PLN.

Similarly, the consumers are willing to pay a maximum of 0.70 PLN extra per cubic meter to get completely clear water at all times. This is an improvement compared to the current situation.

This demonstrates that when presenting the reasons for investments to the users, the main argument should be the possibility of avoiding slightly coloured water in future. The willingness to pay in order to receive clear water is lower, which indicates that the water is probably quite clear already. If an investment were to avoid a future situation with slightly coloured water, the households would be willing to pay for this investment, in the magnitude demonstrated in the figure.

Text Box 16 illustrates (in bullet form) the main results and the policy guidelines which were presented in the Poznan case study report.

Text Box 16: Key policy guidelines based on willingness to pay research, Poznan

In Poznan, a few selected key policy guidelines were identified, based on the willingness to pay research:

- There was a significant WTP to avoid decreasing quality;
- The WTP is not fully exploited;
- People will pay for the removal of odour from water ;
- People will pay for clear water ;
- The environment can be used as an argument for price increases (for wastewater services);
- The present level of information is considered poor;
- Different information approaches are required for different age groups and gender; and
- Metering will not increase the WTP

4.7 Willingness to pay among enterprises and public institutions

The payments from enterprises and public institutions often constitute a large part of the water utility's revenue. Therefore, when assessing the future revenue, it is important to also consider the willingness to pay for improved water services among enterprises and public institutions.

This is particularly the case in those cities in the CIS countries where enterprises pay a much higher tariff for water services than households do. In this case, there is a substantial cross-subsidisation of the household consumers, and there may be pressure from enterprises to reduce the cross-subsidation.

Furthermore, public institutions may have a significant consumption of water and receive large water bills, but they do not always pay for the services provided to them. At the time of the case study, the Navy in Kaliningrad was such a public institution.

In order to include these issues in the analysis, meetings should be arranged with the large institutional consumers (enterprises and public institutions). It is important to include both the consumers with a large volumetric consumption and the consumers which contribute a large part of

the water utility's revenue. The suggested interview approach is preferable to a questionnaire-based survey. The number of large relevant institutions is limited, and interviews may provide much relevant information both on the available alternatives to buying water from/sending wastewater to the municipal utility and on political acceptability issues.

Text Box 17: Willingness to pay among enterprises and public institutions

If there are consumers who use large amounts of water and/or contribute a large share of the water utility's revenue, interviews should be conducted with these consumers in order to investigate their preferences and likely reactions to an increase of the tariff.

Such interviews should, at least, include the following questions:

- Do the enterprises and the public institutions pay for the water services they receive?
- Is there a cross-subsidisation between these consumers and household consumers? If enterprises cross-subsidise the household consumers, will they also accept this situation in the future?
- How will the large consumers react to an increase in tariffs?
- Are alternatives to public water and wastewater provision available to these large-scale consumers? For example: Can they introduce cleaner technologies? Can they establish their own source of water supply? Can they establish their own wastewater treatment plant? If yes, to any of these questions - what is the approximate cost to the large-scale consumer of making such a shift to lower demand / alternative service provision?

4.8 Price and income effects

The purpose of the demand analysis is to measure how changes in price and income affect the water consumption. The demand analysis is important because the demand influences the optimal capacity of water and wastewater schemes. Two effects are considered:

- an increase in tariffs may lead to lower water demand, which again leads to lower revenues for the water company;
- an increase in household income over time may lead to higher water demand, which again leads to higher revenues for the water company.

It is not relevant to investigate the price sensitivity of the demand if the water bill is not paid according to the actual water consumption. In this case, neither the water tariff nor the income will affect the volume of water consumed. However, many water utilities give household consumers the option to pay volumetric charges according to meter if they install their own meter.

In these cases, analysis of the price sensitivity of demand will be important. Generally we recommend that analysis of the price sensitivity of demand be made unless it is clear beyond reasonable doubt that such analysis will not become relevant at a later stage.

This section gives recommendations on how to assess the sensitivity of households' water consumption to changes in tariffs and household income. First, possible ways to gather data are discussed and, second, a method to estimate price and income sensitivity based on data collected in the quantitative survey is presented.

4.8.1 Data and their collection

In order to analyse the relation between tariffs, income and water demand, detailed information on these issues is needed, on a household level. Macro-economic data on income, water consumption

and tariffs can also be used if a sufficiently long time series is available. However, micro-economic models often give a more precise description of the customers' behaviour.

Types of data

The price sensitivity can be found by using both revealed preference data (RP) and stated preference data (SP). SP data should be used if good RP data is not available. However, as stated earlier, this is often the case.

If RP data is available, it is recommended to collect more observations for each household, e.g. the consumption, tariffs and income for the last three years. This is because there is a difference between measuring changes over time for a household and measuring differences between households at one point of time. The latter is done when cross-section data is collected. In a cross-section analysis, the water consumption for different individuals is analysed. The analysis shows that differences in household income result in differences in water consumption.

If data is collected over several years, it is possible to analyse the individual effect for each household and thus obtain more reliable income sensitivity based on a dynamic analysis. Some household expenditure surveys may provide these (panel) data. In order to use the RP data, information on changes in income and other determinants of water consumption, such as the number of household members, is needed. The dynamic analysis is highly relevant, because the change over time is important in order to assess the possible changes in water demand as the income increases over time.

Data collection

If household expenditure panel data is not available or not sufficiently detailed, RP data on water demand can be collected through the water company or by asking the respondents to bring their water bills to the interview (either as part of a stated preference survey or an expenditure survey).

RP data provides the best basis for evaluating the relation between price and water demand, as the data represents the actual behaviour. SP data is useful if no RP data is available or if there is only limited variation in the tariff over time.

It is possible to collect SP data by asking the respondents if they would change the amount of water consumed if the tariff was changed by a specific amount.

Text Box 18 gives an example of SP data collected in this way in Brno.

Text Box 18: Data on water demand collected in Brno

No registered data was available on water demand and income in Brno. Therefore, the respondents were asked to bring their water bills for the last three years to the interview. These water bills were used to obtain data on the amount spent on water by each of the households. In cases where the respondents did not have the water bills, the amount was estimated. Furthermore, the respondents were asked to state the changes in their income over the past three years.

Two specific changes in the water tariff were presented to the respondents as SP questions. The respondents were asked to state the expected consumption for each of the tariffs. This was done in order to obtain more variation in the value of the tariff variable in the model.

By adding a few questions to the generic quantitative questionnaire in Appendix 5, it is possible to obtain data that can be used to estimate the sensitivity of demand to changes in price and income. This is demonstrated in the Brno case study, see Appendix 14.

4.8.2 Estimation of elasticity

The sensitivity is measured by elasticity. The **price elasticity** is defined as:

- the percentage change in water demand in response to a 1% increase in the price per cubic meter.

This elasticity is expected to be negative, as the consumption is expected to decrease in response to higher tariffs. Furthermore, it is expected that the elasticity is low, i.e. numerically less that one. This means that the water consumption decreases by less than 1% in response to an increase in the water tariff of 1%.

This is anticipated because water is a necessity that most households would continue to consume even if the tariff increases. A decrease in water consumption can be due to more water efficient installations, changed habits, etc. In some cases, a large increase in the price of water may "provoke" a radical change in habits, investments in more water efficient installations etc. The price sensitivity of water demand which results from the calculations should always be assessed in the light of the current level of water use relative to the water consumption in the "best" cities in Western Europe. In many of these cities, the water consumption is in the 100 - 120 lcd range.

At high levels of current consumption, there is more "room" for a substantial decrease in consumption in response to a price change, and low (numeric) values of the price elasticity should be viewed with some suspicion.

The response in water consumption is expected only if the tariff is paid per cubic meter. If, instead, the tariff is paid per household member, relative to the size of the apartment etc., the price elasticity of demand is expected to be zero, i.e. no change in water demand as a result of a price change.

The **income elasticity** is defined as:

- the percentage change in water demand in response to a 1% increase in income.

The income elasticity is expected to be positive, as consumers are expected to increase their consumption as they become wealthier. The general income elasticity may change over time and differ among income groups.

In economies with high incomes, most consumers have satiated their demand for water, and a further increase in water consumption is therefore not likely. In the short term, in this case, the income elasticity is low. In the longer term, changes in housing patterns (a larger share of individual houses with gardens) may lead to changes in water consumption.

On the other hand, in economies where water consumption is a significant item in the household budget, an increase in income is likely to have greater impact on water consumption. In this case, the income elasticity is higher.

It is plausible that the income elasticity changes for households with different levels of income. For instance, a poor family might increase its water consumption more than a wealthy family in response to an increase in the family income. This is because the wealthy family has reached a threshold where it uses the amount of water it wishes to use without considering the price. An example of how to find elasticity is given in Text Box 19.

Text Box 19: Elasticity of water demand in Brno

To compute the price and income elasticity, it is necessary to know how the respondents will react to an increase in price, other things being equal. Therefore, a demand model including all data collected is estimated.

$$\ln(Water\ Demand_{it}) = \alpha + \beta \ln(Tariff_{it}) + \gamma \ln(Income_{it}) + \varepsilon_{it}$$

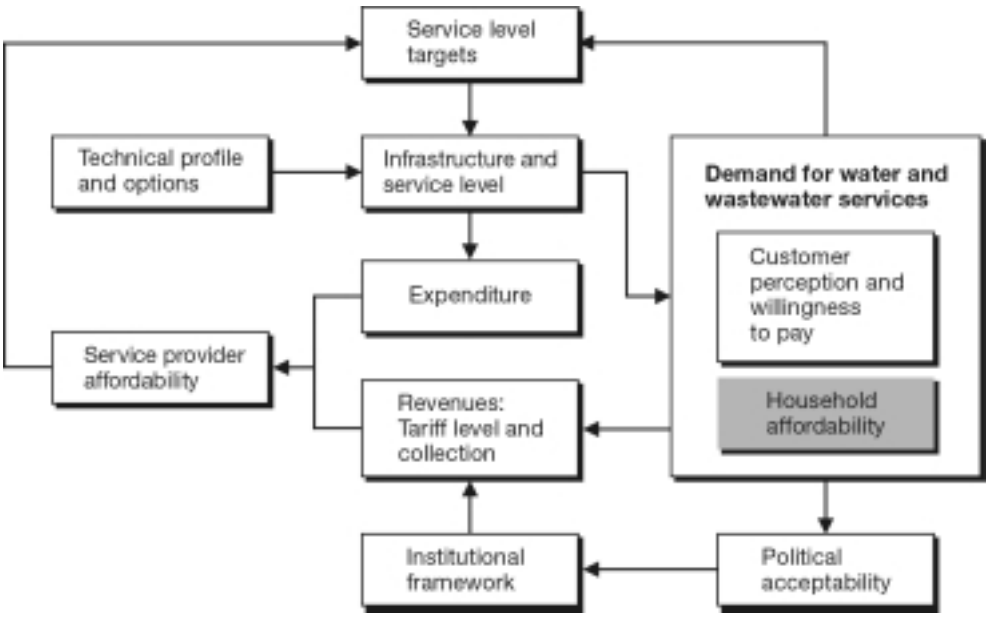
The prefix *ln* indicates that a logarithmic transformation has been made, ß is the price elasticity and γ is the income elasticity. ε_{it} is the unexplained part. The index i is the household, while index t indicates that there are more observations for each household.

The price elasticity is estimated at -0.18, which means that a price increase of 10 per cent results in a 1.8 per cent decrease in water consumption. The income elasticity is estimated at +0.33, which means that an increase of 10 per cent in income results in a 3.3 per cent increase in water consumption.

Hence, the water consumption of the respondents is, as expected, quite insensitive to price, but the income elasticity is relatively high. The results show that the households are not likely to reduce their water consumption very much further in response to an increase in price, but that they will use more water if their income increases.

CHAPTER 5

HOUSEHOLD AFFORDABILITY



5.1 Introduction

5.1.1 Purpose

This chapter and the preceding chapter have a joint purpose namely to provide guidance as to how to assess the demand for water and wastewater services. The demand for services is a function of relative prices, income and preferences of the customers.

The present chapter provides guidance as to methods to carry out an analysis of the affordability in relation to water services.

5.1.2 Target group

The methods and tools presented in the current chapter are relevant for cities in the CEE and in the CIS countries. The methods and tools could also (with minor changes) be used in large cities in developing countries. Parts of the chapter target experts within water utility planning, whereas other parts target experts within market research. In addition, the chapter allows other stakeholders to obtain a grasp of the methods presented and to assess the level of analysis needed for a specific case.

5.1.3 The notion of affordability

The affordability is closely linked to the willingness to pay. However, the customers' own perception of the water cost and service does not influence the analysis in this chapter. Whereas the willingness to pay survey gives information on whether the households are prepared to pay more for improved service or to avoid a worsening of the service, the affordability analysis gives information on the ability to pay. The data collected on affordability is "objective", but it has to be subjectively interpreted by the consultant. This differs from the willingness to pay assessments that are based on the consumers' own subjective assessments of utility and budget constraint.

Society can be seen as the sum of households, enterprises and public institutions. The affordability issues discussed in this chapter concern household affordability.

The notion of **affordability in households** is related to the upper limit of expenditure on water and wastewater services. In the CEE region, and the better-off cities of the CIS, the percentage of income spent on water and wastewater services should not imply that water service becomes a major post on the household budget. This would indicate over-investment in these services. Furthermore, such charges may result in an expenditure level that is not affordable for lower income families and may lead to lower collection rates.

An upper limit of expenditure on water and wastewater for a household cannot be objectively established. Therefore, it is necessary to apply tools to obtain an overview of the average income and the distribution of income, and hence provide indicators as to when there is a problem of affordability that needs to be addressed. Such indicators must be derived from income, expenditure patterns and water consumption.

A household is assumed to be unable to pay if it cannot pay the water and wastewater bills without having to cut down significantly on basic needs, such as food, and other public services, such as heating.

Another definition of ability to pay could be related to the behaviour if non-paying customers were cut off. In this strict sense, few customers would have affordability problems, as water is a necessity good. However, the latter definition is relevant only after the investment decision has been made, and affordability issues cannot influence the level of service provided.

The result of the affordability analysis should influence the target service and the tariff level. Furthermore, it can provide input for the design of subsidy schemes to poor households. The analysis might influence the political acceptability, especially when poor households constitute a major rating block, or if their plight is of concern to the electorate.

Tools are outlined in order to:
- Assess the household's ability to pay for improved service.
- Identify the proportion of households that are likely to have difficulties in paying for improved service.

An overall assessment of household affordability can be based on macro - economic data on average income, expenditure for water services and food expenditure as a share of the total expenditure. In addition, a rough estimation of the income distribution is needed. Macro-economic income data in the CEE and CIS countries is often subject to uncertainty. Therefore, the reliability of the assessment depends on the quality of available data. The collection rates in relation to water and wastewater bills (and in particular recent changes herein) may also provide an indication of affordability. In both cases the data can give a first indication as to whether a group of inhabitants will have difficulties in paying the water bill.

If this is the case, further analysis at household level is recommended in order to obtain detailed information on the nature and size of the problem. This can be done using detailed household data on income and expenditures.

For **enterprises** and **public institutions,** consideration of the affordability in relation to water tariffs is not helpful. The key issues here relate to options for substitution of public service provision and to cross-subsidisation of household consumers. A critical review is needed of tariff structures which imply higher tariffs for enterprises than for households with no reference to the higher costs associated with servicing enterprises. However, we shall not deal further with these issues in this toolkit.

Public institutions have their expenses covered by public budgets. Budget constraints may imply that public institutions are not able to pay for water and wastewater services. This raises a number of issues related to the allocation of public funds to public institutions and to the enforcement of payments from these institutions. However, we shall not deal further with these issues.

5.2 Suggested approach, timing and resources

5.2.1 Approach

We suggest carrying out the analysis in three steps, as illustrated in Text Box 20 below. Each step is described in a sub-section.

Text Box 20: The recommended approach for analysing household affordability

1. Affordability analysis using macro-economic data (Section 5.3)
   - water and wastewater expenditure in terms of share of average household income (Section 5.3.1)
   - food expenditure as a share of total expenditure/disposable income (Section 5.3.2)
   - distribution of income (Section 5.3.3)
   - simultaneity of price increases (food, heat, electricity etc.) (Section 5.3.4)
   - changes in collection rates over time (Section 5.3.5)
2. Affordability analysis using household data (Section 5.4)
   - analysis of income and expenditure data (Section 5.4.1)
   - collection of income and expenditure data when unavailable (Section 5.4.2)
3. Tariff design and financial transfers (Section 5.5)
   - tariff base (Section 5.5.1)
   - eligibility for subsidies (Section 5.5.2)
   - budget effects (Section 5.5.3)

We suggest that the analysis regarding affordability using macro-economic data, Section 5.3, should be carried out first. If the analysis indicates that a group of households have an affordability problem, the more detailed analysis at household level, Section 5.4, will be carried out.

Section 5.5 gives ideas as to tariff design and how transfers can be made to households unable to pay for the water and wastewater services.

5.2.2 Timing

Affordability ought to be an important factor in determining the level of the technical solution, especially when it is likely that households' costs rise above an unacceptable level. Therefore, optimal timing of the affordability analysis is early in the planning process. This applies whether a traditional investment project in a public utility or a concession agreement is planned.

19 For example, the World Bank has some useful data available:
http://www.worldbank.org/data/countrydata/aag.htm

For **a traditional investment project** in a public utility, part of the affordability analysis should be undertaken during the pre-feasibility phase. In this phase, overall estimates should be produced of the share that the cost of water constitutes of the household income, whereas a detailed analysis of the income distribution and expenditure can be carried out along with the willingness to pay analysis.

For **a PPP arrangement,** the optimal timing is likely to be prior to or simultaneous with the announcement of the selected short list of firms invited to submit a bid for the lease, concession etc. The short-listed firms will find it useful to have an indication of affordability in order to assess the tariff that is likely to be acceptable at a given future service level.

Furthermore, the municipality may find the affordability analysis useful in order to anticipate subsidies to poor households.

5.2.3 Resources required

The resources required are given in the table below. If no household level data is available on income or expenditure, a separate survey should be carried out in order to make the affordability analysis at household level.

Table 5.1:Resources required for the affordability tasks

	Person Weeks	Calendar Weeks
Affordability in society in general,	1	2
Household affordability	1-4	2-4
- If register data or survey data is available	1	2
- If expenditure survey is to be carried out	4	4
Tariff design and financial transfers	1	2
Total	3-7	6-8

Disclaimer: The resource requirement has been estimated by COWI and is not necessarily endorsed by DEPA or EBRD

If the household expenditure survey is needed, the affordability analysis is expected to require approximately seven person weeks and eight calendar weeks.

If data on household income or expenditure data is already available, the affordability analysis can be carried out with an input of approximately three person weeks and over a period of six weeks.

5.3 Affordability analysis using macro-economic data

This section suggests an affordability analysis that can be made when micro-economic data on households is not readily available[19]. Macro-economic data available from national statistical sources and from international databases.

Based on macro-economic data, we suggest the following analyses:

Data on **average income** is used to investigate whether an average household can afford the expenditure that results from the investment in improved services. An example of such an analysis is provided in Section 5.3.1. The **composition of household expenditure** can give an insight into whether

the households will have difficulty in paying the water bill. Section 5.3.2 discusses how to do this.

Income is often distributed unequally among the households in society. Affordability can be a severe concern for segments of the population also when there is no affordability issue for the average household. In order to evaluate the proportion of households that may experience difficulties in paying for the services, the distribution of income is of significant interest. Income distribution is discussed in Section 5.3.3.

Further, it is important to include simultaneous price increases for water and other goods and services in the analysis. If the price of heating or electricity goes up in the same period of time as an increase in the cost of water and wastewater services is planned, this is likely to influence the affordability negatively, see Section 5.3.4.

Finally, **changes in the collection rate** can be used as a very rough measure of affordability, as a high collection rate indicates that customers, all things equal, are able to pay, see Section 5.3.5.

5.3.1 Cost and average income

An average measure of the cost of future water is useful in order to obtain an overall impression of whether the society can afford the planned investment in improved water and wastewater services. The cost of water and wastewater services as a percentage of the average household income or the cost of water and wastewater services as a percentage of the GDP per capita constitutes useful measures.

The maximum affordable level of combined water and wastewater services is often based on the rule of thumb that the average payment for these services should not exceed 4% of the average household income. This is as a first indicator of affordability.

When analysing an investment scenario, the future share of household income needed to pay for water services should be considered. This is done by using an official forecast of the income per capita and the expected increase in tariffs in different scenarios. In this analysis, it is suggested that the tariff depends on the level of investment, only, and not on macro-economic fluctuations affecting the loan. This means that it is assumed that the loan is secured in such a way that the increases in tariffs can be forecasted without risk.

The analysis should be made for each scenario considered, i.e. for each level of the tariff. Text Box 21 gives an example from Kaliningrad. In the example, the project has already been chosen. Therefore, there is only one scenario.

The rule of thumb mentioned above cannot stand alone. While an average exceeding 4% indicates potential affordability problems, a low share of water cost is not sufficient to conclude that affordability problems will not occur. The reason is that the income variation may be large, thus making it difficult for some households to pay the water and wastewater bills. Furthermore, there may be simultaneous price increases in other household expenditure such as electricity and heating. In this case, even the 4% threshold may represent an unacceptable burden.

Text Box 21: The cost of water and wastewater in the investment period

The tariff has to increase in Kaliningrad in order to cover the planned improvements of the water and wastewater services.

At the end of the investment period, the water and wastewater costs will amount to more than 4% of the inhabitants' income. This may limit the ability to pay of a large group of people.

Expected increase in water tariffs and income as well as the average cost of water services as a percentage of real income

	2000	2001	2002	2003	2004	2005
Increase in the real water tariff	33%	20%	40%	30%	6%	6%
Increase in the real income	3%	3%	3%	3%	3%	3%
Water cost as a share of income	1.9%	2.3%	3.1%	3.9%	4.0%	4.1%

Note: The increases in real water tariff are as proposed in Krüger (1999): Kaliningrad water and wastewater services feasibility study.

Sources: Krüger and the Ministry of Finance of the Russian Federation.

5.3.2 Composition of expenditure

The composition of expenditure provides important information on affordability. The World Bank has suggested that households that use 70% of their disposable income on food are "absolutely poor". Hence, if the average spending on food approximates 70%, there is likely to be a problem of affordability.

Therefore, the composition of household expenditure provides a useful measure of the households' wealth, cf. Text Box 22. In the text box example, total household expenditure has been used instead of disposable income. In a society where there is almost no saving or dissaving, there is little difference between expenditure and disposable income. Thus both measures can be used.

The distribution of expenditure may differ significantly from one region to another because of institutional differences. This can make comparability across regions difficult. For instance rent constitutes a very small part of the household budget in some CIS countries.

Some literature suggests using the share of expenditure for tobacco and alcoholic beverages as a minimum level of acceptable expenditure for water and wastewater services. This measure requires access to a reliable household expenditure survey, and only provides a rough assessment.

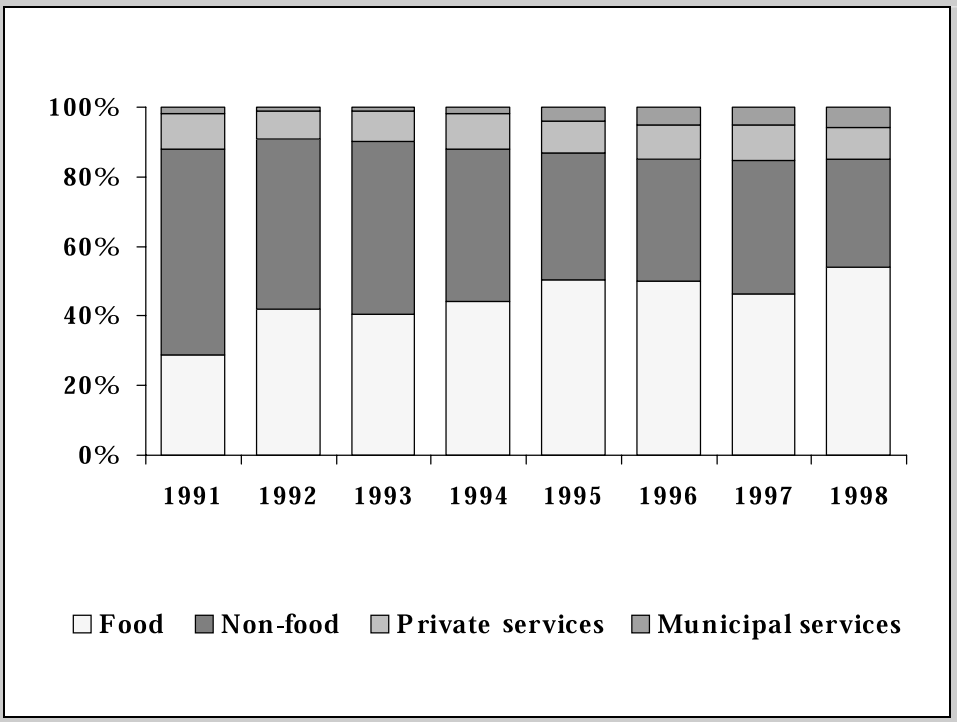
20 Cf. e.g. Deaton, A. (1997): The analysis of household surveys: A micro econometric approach to development policy. The Hopkins University Press. Software for calculation of inequality measures is found on http://www.worldbank.org/lsms/tools/povcal/index.htm.

Text Box 22: Composition of expenditure in Kaliningrad, 1991 - 98

The average expenditure on food has increased from 29% of the total expenditure in 1991 to 54% in 1998.

This change in the expenditure composition clearly indicates that the citizens of Kaliningrad have become substantially poorer since 1991. A share of food expenditure amounting to 54% of the total expenditure also indicates that there is not much room for increasing charges for services. This is exacerbated by the expected future price increases for rent and other utilities.

Composition of expenditure in Kaliningrad, 1991 - 98



Note: Non-food includes alcohol and meals outside home

Source: Kaliningrad Statistical Committee.

5.3.3 Income distribution

Great variation in income distribution makes the average income a poor proxy for representative household income. Therefore, the analysis of income and expenditure should be supplemented with measures that take income distribution explicitly into account.

If income distribution data is not available, a summary measure of inequality can be applied. One such measure is the Gini coefficient which can be calculated using income deciles[20]. The Gini coefficient can be used to evaluate whether the income distribution is unequal compared to other areas. However, this is a very indirect and poor measure of affordability for the lower income groups.

The literature takes income distribution explicitly into account in different ways. Some literature suggests relating water and wastewater expenditure to the income of households at subsistence level. Usually, there is an official measure of per capita subsistence income, e.g. in connection with setting the minimum pension. However, there is no consensus as to what is the appropriate share of income to be used for water and wastewater for households at subsistence level.

If income distribution data is available, the share of income used to pay as an average bill for water and wastewater services can be estimated for each income group. This will give an indication of the proportion of households that spend more than a certain percentage of their total income on water and wastewater services. This is, however, only an indicative measure, as a large proportion of the poorest households are eligible for subsidies.

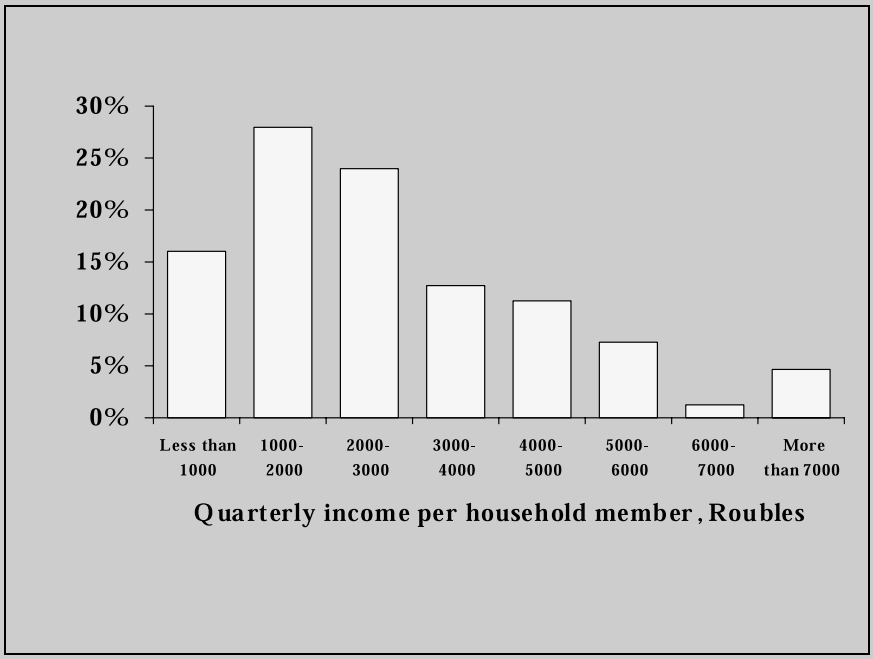
Furthermore, if consumption is metered, poorer households can, and generally do reduce their water bill. In this way, the households themselves mitigate the affordability issue.

Text Box 23: Income distribution in Kaliningrad

The average quarterly disposable income per household member is approximately 3,000 roubles. The equivalent average cost of water services in 1999 was approximately 40 roubles.

For 16% of the inhabitants with an income of less than 1,000 roubles, the cost of water and wastewater services exceeds 4%, at present. This group might have difficulties in paying higher water tariffs without compensation.

Income distribution in Kaliningrad, third quarter 1999



Note: Data is from the third quarter of 1999.
Source: Kaliningrad Statistical Committee.

5.3.4 Simultaneity of price increases

When designing the future scenarios of services and tariffs, it is useful to have information about the expected development in the price of other goods and services.

Municipal authorities should be aware of the total impact on households of simultaneous price increases on various public services such as water services, heating, electricity etc. Thus an assessment of the maximum tariff for water and wastewater services must, therefore, take into account the implications of other price increases. A calculation of residual income after paying for the public services may contribute to the assessment.

An example of this analysis from Sevastopol, the Ukraine is given in Text Box 24.

Text Box 24: Simultaneous price increases in Sevastopol, the Ukraine

The real income per capita is estimated to increase by 18% over the period 2000-2005 based on real salary projections provided by the EBRD. This implies that the real income per capita in 2005 will be 23 UAH/month higher than the present level.

The incremental expenditure per capita in connection with the heating and water projects is estimated at 11 UAH/month in 2005. Implementing the two projects concurrently implies that households will have to reserve almost 50% of the expected increase in real income in 2005 for increased expenditure on heating and water services.

Though this indicates that it is feasible in affordability terms to implement the two projects concurrently, close co-ordination of the implementation of the projects is required.

5.3.5 Collection rates

Sometimes the change in collection rates following former price increases can be used as a rough measure of ability to pay. If there is a significant increase in the collection rate, this could indicate that there are no affordability problems, whereas no increase in the collection rate could indicate the opposite.

The collection rate is a very indirect measure of affordability compared to income and expenditure. The collection rate depends on the collection procedure and whether non-paying customers are cut off. If non-payment does not have consequences for the non-payers, the collection rate is likely to be low.

The change in collection rate can only be used as a proxy for affordability if there is no simultaneous change in the institutional framework for billing and collection.

Text Box 25: Collection rates in Kaliningrad

Approximately 65% of the Kaliningrad population has its water tariff collected by the municipal billing company Simplex.

After the tariff was increased by 150 per cent in July 1999, the collection rate declined from almost 80% to less than 50%. This indicates that a large number of the households got affordability problems after the tariff increase.

5.4 Affordability analysis using household data

If data on household expenditure is available or an expenditure survey is conducted for the purpose, it is possible to obtain better insight in to the households' financial situation.

If such micro-economic data is available, useful measures are:

- Distribution of water expenditure as a percentage of income.
- Share of income used for food.
- Distribution of water cost as a percentage of income after expenditure on food.

With these measures it is possible to assess the proportion of households that will experience problems with regard to their ability to pay as the services improve and the tariffs increase.

This section describes the above measures as well as a method to conduct an expenditure survey, in the case where a detailed analysis of household expenditure is required and no data is readily available.

5.4.1 Income distribution and expenditure patterns

Water expenditure as a share of income

With detailed data on household income and household expenditure on water and wastewater services, it is possible to analyse the distribution of water expenditure across households.

This can be done both in the situation before and after new investments have been made. By choosing an appropriate assumption on income growth and tariffs, illustrative scenarios of the future situation can be made.

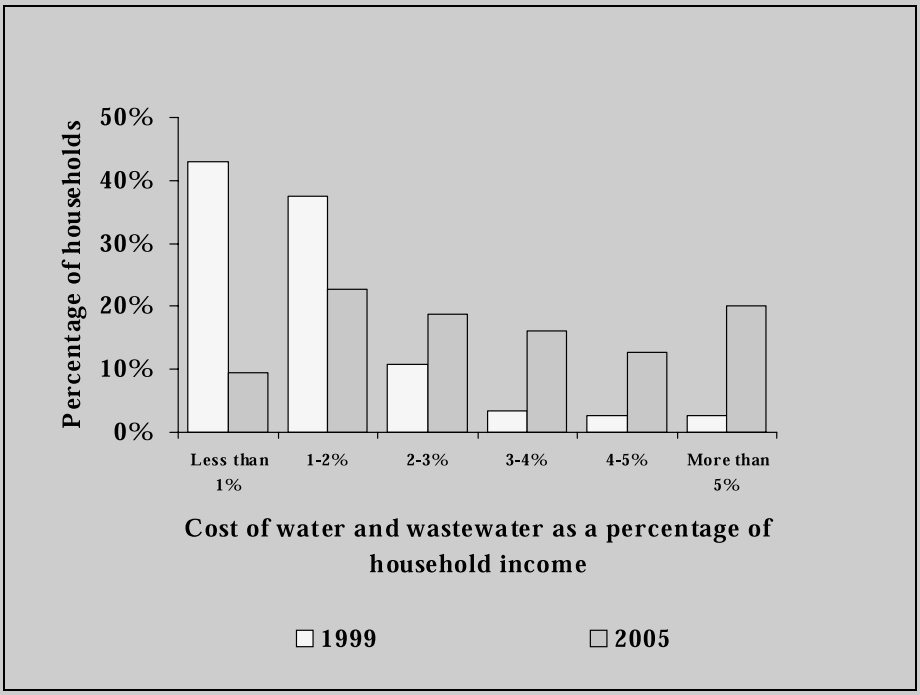
Text Box 26 illustrates the expenditure for water and wastewater services as a percentage of household income in 1999 and the possible distribution in 2005 with likely increases in the water tariff and income.

Text Box 26: Cost of water and wastewater services as a percentage of income, Kaliningrad

At present, most households spend less than 2% of their income on water and wastewater services. Only 5% of the households pay more than 4% which indicates that the affordability problem is very limited, at present.

For the distribution in 2005, it is assumed that all households have a yearly increase in real income of 3%, and that the water tariff increases by approximately 200%. These increases are equivalent to the assumptions in Text Box 21.

With the assumed changes for 2005, a large proportion of the households will spend more than 5% of the income on water and wastewater services which indicates that there might be a problem of affordability.



Sources: Kaliningrad Statistical Committee, Krüger and the Ministry of Finance of the Russian Federation.

Food expenditure

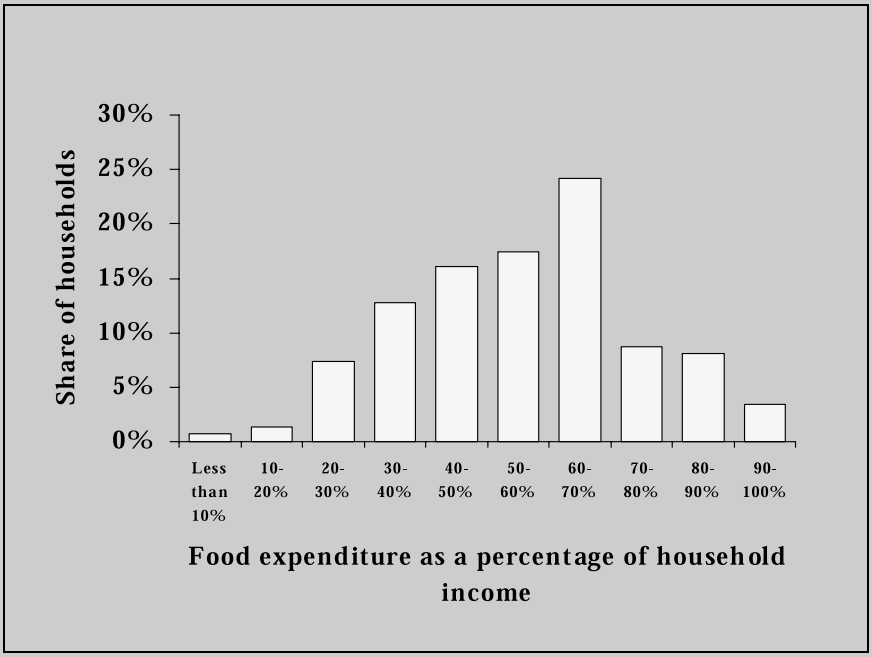
The composition of expenditure provides important information on wealth, cf. Section 5.3.2. With data at household level, it is possible to analyse the proportion of households in which food expenditure dominates the budget.

If a large proportion of the households have food expenditure that exceeds 70% of the disposal income, an affordability problem is likely to occur. Text Box 27 illustrates the situation in Kaliningrad.

Text Box 27: Food expenditures as a share of income, Kaliningrad

In Kaliningrad, 20% of the households have expenditure on food that exceed 70% of their disposable income. This indicates that 20% of the households are absolutely poor, and that these households might have difficulties in paying the water and wastewater bills when the tariffs increase.

Food expenditure as a percentage of household income



Sources: Kaliningrad Statistical Committee.

Water cost as a share of the disposable income after expenditure on food

If a large proportion of the income is used for food, it can be difficult for the households to save money on the budget in order to pay higher water tariffs. Therefore, a relevant measure is the cost of water as a share of the household income not used for food. To ease the terminology, this is called the residual income.

This gives an indication of whether households are able to save money to pay higher tariffs for water without cutting in their budget for food. A share of more than 10% indicates that the household is likely to have affordability problems.

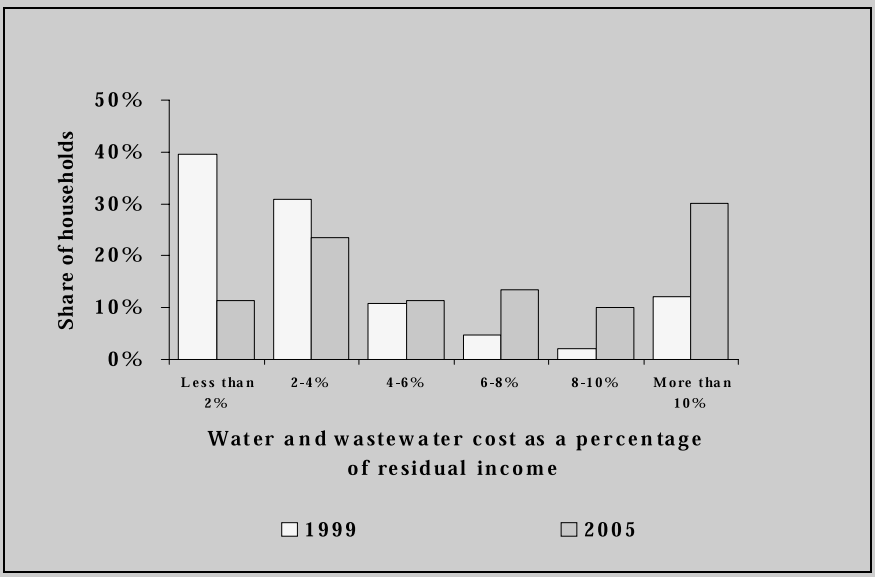
Text Box 28: Cost of water and available income after food expenditure, Kaliningrad

The amount spent on water and wastewater services can be compared to the income after deduction of food expenditure, hereafter called the residual income.

For most households in 1999, the share of water cost, as a percentage of the income not used for food, was less than 10%. For the vast majority, this share was lower than 4%.

In 2005, when the increases in tariffs will have been introduced, almost one third of the households will spend more than 10% of their residual income on water and wastewater services.

Water and wastewater cost as a percentage of residual household income (income available after food expenditure)



Note: Residual income is defined as the income available after expenditure on food

Sources: Kaliningrad Statistical Committee, Krüger, Ministry of Finance, Russian Federation, COWI

5.4.2 Survey on income and expenditure when data is not available

In cases where up-to-date and reliable income and household expenditure data is not available, it is suggested that a household expenditure survey be carried out. An example of a questionnaire to be used for a brief expenditure survey is given in Appendix 8.

The informal economy often plays a substantial role and makes it difficult, if not impossible, to get trustworthy data on income through a survey. To circumvent this problem, one can ask for household expenditure levels for a broad range of items.

Although this method does not provide for the entire household income/expenditure level, it should give a reasonably trustworthy lower limit on the level of income. Furthermore, this approach also reveals the share of each expenditure item out of the total expenditure, which makes it feasible to give an estimate of the affordability related to an increase in the water bill.

Text Box 29: Expenditure Survey Lviv, the Ukraine 1996

There are several reasons why the collection of income data in the Ukraine was difficult. First, a new taxation scheme was implemented and, therefore, the citizens were unwilling to reveal their income. Second, there are no reliable income statistics that include the informal part of the economy.

To circumvent this problem, an expenditure survey was conducted among 500 respondents. The survey was conducted as part of a telephone survey on water and wastewater services. The expenses included were the following:

- rent, heating, electricity, water and wastewater, food, beverages and tobacco, clothes, transport, telephone, newspapers, magazines, entertainment, and other.

Furthermore, the respondents were asked if they had been buying durable goods, or if they had been travelling during the past year. This included:

- durable consumer goods, furniture, cars;
- travelling in the Ukraine or, if outside, the country of destination

In general, the respondents were less willing to answer the questions in the expenditure survey than those in the rest of the questionnaire. 52% at least specified the monthly expenses on food, rent and heating, and those respondents were used as a basis for making a rough estimate of the average income and income distribution.

Comparing the result of the expenditure survey with official statistics on income indicates that the estimated income of the respondents in the survey was 20-30% higher.

Based on experience, a survey size of approximately 500 persons is likely to be required. The expenditure survey sample must be larger than the sample for the stated preference questionnaire due to the greater reluctance of people to respond to the expenditure survey.

Expenditure data collected in this way should be complemented by official statistics on average wage levels and official income data. These provide a consistency check between the household expenditure survey and official data.

5.5 Tariff design and financial transfers

Two issues related to tariff design and subsidies are discussed in this section: the tariff base and its structure.

First, it should be analysed whether the tariffs should be based on the actual use of water, or whether they should be based on norms. Second, it should be investigated whether there should be an equal tariff for all inhabitants, or if certain groups should be eligible for subsidies or privileges. The latter issue is relevant in most countries where certain groups benefit from subsidies. Subsidies should be designed to help minimise the affordability problem. If an increase in tariffs influences the need for financing from other parties than the consumers (e.g. tax payers), the consequences should be considered.

This section lists the issues that are recommended in order to analyse the existing design, and a brief discussion of which issues to consider if changes in the tariff structure are anticipated.

This section is closely related to the tariff base and structure in CIS countries, and mainly relevant for these countries.

5.5.1 Tariff base

The tariff can either be related to the actual use of water or not. Basing the payment on the actual water consumption gives an incentive to economise on the amount of water used. However, it requires that meters are installed in all households, which might be too expensive compared to the benefits received.

The household tariff can also be based on the number of household members or norms such as kitchen hardware or number of square meters of the residence. If the measure is not related to water consumption, even indirectly, there is no incentive to reduce water consumption.

Text Box 30: Tariff base

- Kaliningrad, Russia: Households are billed according to the number of household members.
- Brno, the Czech Republic: Households are billed according to metered water consumption.
- Poznan, Poland: Some households are billed according to metered consumption, other households according to a norm.

5.5.2 Eligibility for subsidies

In some of the CIS countries, there are two types of reduction in tariffs: Privileges and subsidies. Privileges are often given in lieu of wages or pension payments, e.g. to veterans or citizens holding an official position, while subsidies are given to households who have difficulties in paying their bills.

Text Box 31: Eligibility for subsidies in Lviv, the Ukraine

In Lviv, there are two types of reductions obtainable: privileges and subsidies.

In the expenditure survey described above, 25% of the respondents received privileges. Most of those respondents received their privilege because of their social status and not because they were unable to pay themselves.

The criterion of eligibility is that the payments for water, heating and electricity must exceed 15% of the household income. The household survey indicated that almost half of the respondents interviewed were eligible for a subsidy, whereas only 8% of the respondents indicated that they receive a subsidy. The reason for the discrepancy could be that the application procedure is cumbersome.

The household survey also indicated that the income distribution among respondents was similar in the group who received privileges and the group who did not. This illustrates that privileges are not closely linked to social need.

Special privileges imply that groups of households do not pay a normal price for water services. If a large proportion of the households receive privileges, or subsidies are not motivated by affordability

problems, the tariff structure is likely to be inefficient. Such structure should therefore be revised critically. A suspension of privileges would ease the financing of subsidies directed at households with affordability problems. However, this is often a difficult, national political issue.

5.5.3 Budget effects

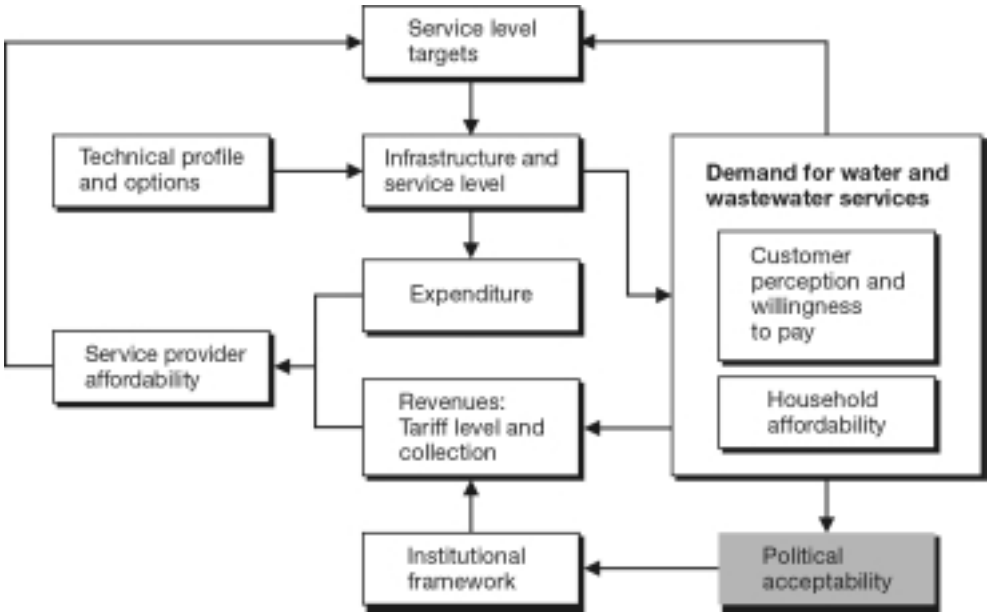
The effect on the public budget of investments in improved water and wastewater services should be considered. There are both direct effects of the contribution to the investment and possibly operation expenditure and indirect effects of the impact on privileges and subsidies that result from increased tariffs.

It is recommended to consider carefully the impact on tariff increases including increases in the price of other utilities, and on subsidies due in the future.

Currently it is often only a small share of those eligible for subsidies who apply for them. However, if tariffs increase, the propensity to apply for subsidies paid out may therefore be considerable. It is recommended to calculate alternative scenarios for the propensity to apply for subsidies an to calculate the effect on the municipal budget in these scenarios.

CHAPTER 6

POLITICAL ACCEPTABILITY



6.1 Introduction

6.1.1 Purpose

The **purpose** of this chapter is to explain the rationale of political acceptability analysis and to provide guidance on how to carry out an analysis that makes it possible to assess the level and nature of political acceptability in relation to an investment project in the water and wastewater services sector.

6.1.2 Rationale for analysing political acceptability

Often, the analysis of political acceptability is omitted or given very low priority. This is true not only for water services in the CEE and CIS countries, but also for major investment projects in, say, Denmark. The political science analysis tends to be perceived as soft, and the value-added is often neither clearly explained by the political scientist who can do the analysis, nor are there many success stories to refer to.

However, there is an increasing appreciation that apparently simple questions such as:

- "Why are large tariff increases politically accepted in one situation/project, but not in another?"
- "Why are solutions that are apparently, technically, environmentally and financially sound (like the sinking of Shell's used oil exploration platform "Brent Spar" on the ocean floor) rejected politically?"

need to be addressed neither by technical nor economic analysis, but by analysis of political acceptability.

We present different levels of political acceptability analysis ranging from a simple to more sophisticated models.

By **political acceptability,** we refer to decision makers' attitudes to a specific water sector investment that entails changes in water tariffs. The decision makers can be formal decision-makers, e.g. a ruling

political party in a municipality, or it can be other actors who, de facto, have a saying in the decision-making process.

Political acceptability at the level of the local decision makers is a key choice-limiting factor for investment projects in the water sector because such projects are decided upon and implemented in what is typically a very politicised arena.

Actors with potentially conflicting interests populate this arena. The **local politicians** are there. They are interested not only in a healthy municipal economy and high service levels but also in re-election. The **civil servants** and the **administrative units** play a role, too. They may have tight bonds to the water industry, and this may bias their perception and action. The **local population** will also be in the arena, either directly as **voters** influencing the direction of the politicians via popular elections or via **interest organisations.** The arena also gives place to **national actors** who mark out the legal framework and the overall national political objectives that exercise influence on the local decision makers.

This arena determines the fate of an investment project. Not only whether an investment (or a tariff change, a change in ownership, etc.) will be approved in the first place, but also whether the investment will prove successful, in the long run. Will the water charges, for instance, be collected properly and the agreed upon conditions met even in times of public dissatisfaction?

It is, therefore, fair to take as starting point the assumption that the higher and more stable the political acceptability is, the lower the revenue risk in relation to a given investment. Our task is to detect the level and nature of the political acceptability of a given investment.

More specifically, there are four main reasons for conducting analysis of political acceptability. They are:

1 **Political acceptance ultimately determines whether a project is feasible.** The political actors are responsible for deciding on, implementing and enforcing water tariff increases. The level of risk of any prospective loan is thus directly linked to their ability to carry out these implementation and enforcement functions. Moreover, the decision makers are responsible for many factors which will determine both the effectiveness of any given charging system and the public acceptability. Examples of these factors include: scope of application of tariffs (i.e. if certain customers are exempt to ensure affordability); the operating status of the water supply company; regulation of the water supply company (anti-monopoly controls, etc.) and the methods to enforce collection of tariffs.

2 **There will often be a degree of discrepancy between public acceptability and political acceptability.** Measuring public acceptability does not capture whether a given political-administrative system will actively seek to minimise an investors' revenue risk by sticking firmly to agreements made, or on the other hand whether it is inclined to please the public opinion if it resists to pay the increased water tariffs.

3 Political acceptability analysis **illuminates the different risks** at stake in the case of changes in the water sector. The investor wants to minimise the revenue risks while a vote-maximising political party will have to consider the costs of pursuing a policy that minimises revenue risk, but increases the risk of decline in voter support (a political risk). This is a real threat as the most obvious result of unacceptable charges will be the public pressure on the decision

makers to reduce charges and/or to be less strict with regard to enforcement. Should this happen, the economic viability of an investment in the water sector could be seriously affected.

4 **Different time perspectives.** Investments in the water sector typically have a time perspective of, say, 20-40 years, compared to the typical time horizon of parliamentary democracies which seldom exceeds four years (time period between popular elections). It is, therefore, crucial from the perspective of the investor to have confidence in a high and stable level of political acceptability that goes beyond election periods.

These points can be summarised in one general observation. Even if it is difficult to measure political acceptability in exact terms, a systematic description and tentative ranking of acceptability is useful when considering the potential revenues and, thus, the pay back and sustainability of an investment in the water sector.

6.1.3 Target group

The text in this chapter **targets policy analysis experts.** However, the text also allows other stakeholders involved in municipal water supply and wastewater to obtain an overall grasp of the methods presented and to decide on the level of analysis to be used for a specific case.

6.2 Suggested approach, timing and resources

6.2.1 Approach to analysis of political acceptability

This section describes the recommended approach to undertaking a political acceptability analysis, cf. Text Box 34.

Text Box 34: The recommended approach to political acceptability analysis

1. Consider, always, a number of societal factors, independently of how comprehensive the analysis is designed to be (Section 6.3).
2. Capture not only the level of acceptability, but also the stability of political acceptability (Section 6.4).
3. Decide, at an early stage of the analysis, if acceptability should be measured at the level of political parties or include a broader range of actors (Section 6.5).
4. Adapt the analysis, in each case, in order to fit needs and resources available. Therefore, analysis at four levels and a recommendation as to which one to use will be presented (Section 6.6):
   - Attitudes of political parties (Level 1, See Section 6.7)
   - Attitudes and assumptions of political parties (Level 2, See Section 6.8)
   - Analysis of a broad range of actors (Level 3, see Section 6.9)
   - Policy network analysis (Level 4, see Section 6.9)

   The four levels differ with regard to comprehensiveness, ability to predict, and resource requirements. Only the first two are presented in depth.
5. Report on the findings (Section 6.10).

6.2.2 Resources required

The amount of resources required depends on the level of analysis selected. The figures are indicative. The input depends on the number of actors, and how easy it is to get access to information. If the more profound analysis including a broad range of actors or policy analysis is conducted, the number of person weeks needed may vary between 6 and 14.

Table 6.1: Resources required for the two simplest levels of analysis of political acceptability

	Person weeks	Calendar weeks
Attitudes of political parties	3-4	6
Attitudes and assumptions of political parties	4-5	8
Total	3-5	6-8

Disclaimer: The resource requirement has been estimated by COWI and is not necessarily endorsed by DEPA or EBRD

The content of each analysis and the specific resource requirements are further detailed in Section 6.6.

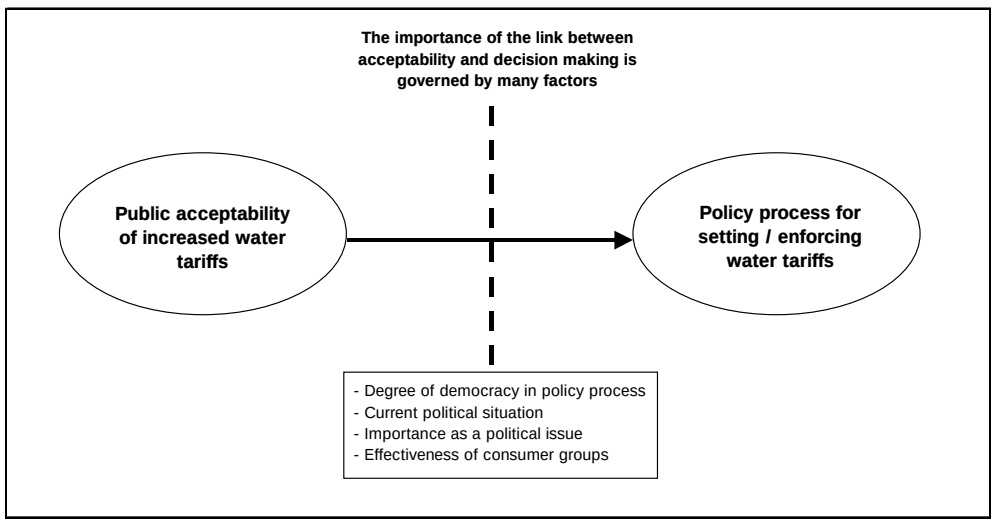
6.3 The background factors

Independently of which analytic design is chosen, it is always relevant to consider the societal factors that influence each case. This section describes some of the factors that should be looked at.

The influence of public acceptability

The first factor to consider is the level and character of public acceptability. In most political systems, public opinion can be expected to be the major influence on the policy makers, but it should not be taken for granted that a certain degree of public acceptability will gradually spill over in corresponding political decisions. There are several factors that can determine how, and to what extent, the influence of public opinion is exerted, cf. Figure 6.1.

Figure 6.1: The effect of public acceptability on political acceptability



21 In well-functioning political systems the political parties will adapt to the preferences of the population; hence there will be a tendency towards the same level of public and political acceptability of a given issue.

It is, therefore, important to always study these factors in order to understand the extent to which public acceptability (or the lack of it) influences the setting and enforcement of water charges. Factors that should be looked at are the following:

- The **degree of democracy** involved in **the policy process** - the less democratic the system is, the less influence public acceptability is likely to have[21];
- The **current political situation** is likely to influence the "vulnerability" of political parties. For example, it is unlikely that any unpopular decisions will be pushed through in the run up to an election;
- The **relative importance of water charges as a political issue.** Even if there is strong opposition to water charges, they will have to be seen as key political issue (i.e. capable of influencing voting behaviour), before they will have a major impact on the policy process. The importance as a political issue is obviously influenced also by the rate of change in tariff and may be influenced by related issues such as the prospect of concurrent staff reductions etc.;
- The **level of organisation of consumers** and other groups representing the public interest. Consumer groups are traditionally among the weakest forms of lobby groups. It is important to assess the effectiveness of the channels through which (potential) dissatisfaction with water charges will be expressed in order to estimate its likely impact.

Institutional factors

The institutional framework for decision making in relation to water tariff setting should always be considered as a background factor.

One of the decisive factors is **the procedure for water tariff setting.** The more institutionalised it is, the less likely it is that political turmoil will influence the case. The rules concerning water tariff setting are traditionally set in national legislation, which is an institution that is difficult to alter. Local political interference will find it hard to change these rules. However, the national rules on price setting may leave small or large discretionary powers with local authorities, such as the city councils, to determine the actual price levels. The larger the discretionary powers given to the local price determining authority, the more sensitive to political interests the issue is likely to be.

There are other institutional factors that should be kept in mind, in particular:

- The historical patterns of water charges;
- The ownership of the water utility; and
- The legal status of utility. This will govern many aspects of the way in which a utility is able to function in practice and its degree of susceptibility to public and political acceptability.

The influence of other factors

At the initiation of the study on political acceptability, the analyst should consider a number of other factors that may influence the case. A checklist with such background factors is given in Table 6.2.

Table 6.2: Other factors which may influence political acceptability

Factor	Possible impact
Rent seeking	Particularly if foreign investors are involved, it is possible that political support of price increases may be conditional on payments by the investor concerned.
Expectation of subsidies	If there is a belief that investment and operational subsidies may be available for carrying out the project there is a potential for local policy makers to wait and see if such subsidies materialise instead of pressing ahead with less popular price rises.
Media	In the absence of precise measurements of public opinion, a media campaign against (or even for) price increases can determine political decisions.
Awareness of environment and public health issues	If policy makers themselves accord a low priority to environment and public health issues, then other political objectives will be accorded a higher priority.
International guidelines	Influential donor organisations using various rules of thumb (e.g. the 4 per cent rule for household affordability) can influence politicians as to what they consider acceptable, regardless of any underlying rationale for the rule of thumb.
Administrative implementation costs	In the case of an administration with low levels of administrative capacity and/or resources (particularly likely at the local level), the administrative costs of implementing the structural reforms (e.g. mechanisms for compensating the socially vulnerable for a significant increase in water charges) may surpass administrative capacity. In this case, it may not be feasible to implement structural reforms. Alternatively, administrators may use such a situation as leverage to gain extra resources.

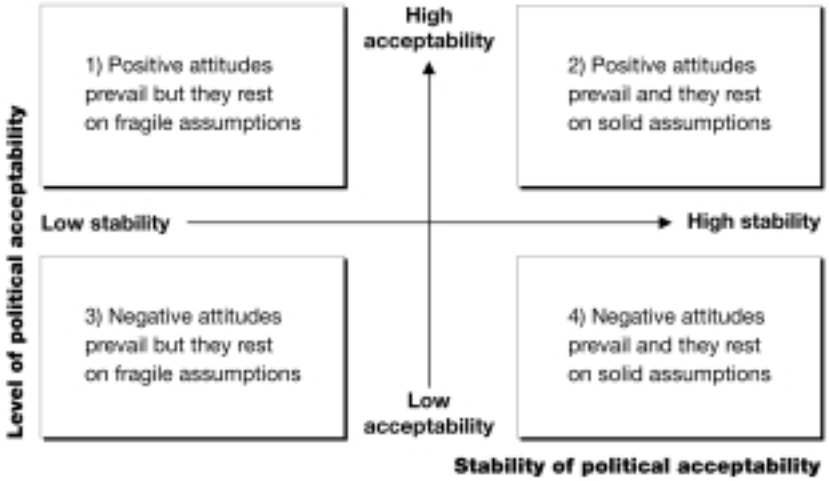
6.4 Assessing the level and stability of political acceptance

We define political acceptability as being composed of two elements:

- **The level of political acceptability.** This can be captured by analysing the actual attitudes - positive or negative - among decision makers to a certain initiative or proposal in the water sector, typically to increase water tariffs in return for higher service levels. It can be measured in quantitative terms (x per cent in favour of a proposal - x per cent in opposition), but should be supplemented with qualitative refinements.
- **The stability of political acceptability.** To capture the stability of attitudes implies an identification and investigation of the assumptions on which the decision makers base their attitudes (implicitly or explicitly). The assumptions should be described qualitatively.

Combining the two dimensions, we get four different scenarios, cf. Figure 6.2. Each of these scenarios differs with regard to the way in which an investor should approach the situation.

Figure 6.2: Four scenarios of political acceptability (level and stability)



The first scenario is characterised by an apparently high level of political acceptability as the project in question is given a positive evaluation. However, the attitude rests on assumptions that are not stable implying that it is not necessarily well grounded. This is the case if, for example, the political actors favour the investments believing that it will lead to improved drinking water quality whereas, in reality, the investment is necessary to avoid deterioration. The investment will thus "just" lead to maintenance of status quo.

From the perspective of an investor: The investor runs the risk of overlooking the fact that the political acceptance is fragile. It is, therefore, necessary to investigate, in detail, the assumptions on which the positive attitudes are founded in order to determine the likeliness of changes in these.

The second scenario is the one characterised by a genuine, high acceptance, as the positive stance is not based on assumptions that are likely to change.

From the perspective of an investor: This is the optimal situation with minimum revenue risk as there will be a high degree of commitment and stability vis-à-vis the project.

The third scenario is an interesting scenario, which is maybe more promising than it looks at first. There is a dominance of negative attitudes to the investment, but the attitudes rest on assumptions that are not stable and, therefore, it may be possible to change them. One example could be that increased water tariffs are opposed due to social reasons. If the social imbalances of higher water tariffs could be corrected, the attitude may change rapidly.

From the perspective of an investor: Explore the opportunities to counter the objections thereby undermining the assumptions that create the negative perception of the project.

The fourth scenario is the one with a low acceptance. Few actors appreciate the investment, and this perception is well grounded.

From the perspective of an investor: There are major barriers to the investment/project, and these barriers are not easily overcome.

We recommend that the distinction between level and stability be applied when assessing political acceptability.

Text Box 35: Poznan: The high level of acceptability rested on a fragile assumption

Interviewing a number of leading politicians in Poznan (city councillors) first gave the impression of a high level of acceptability of significantly higher water tariffs. However, during the interviews when it was made clear to the politicians that according to technical assessments, higher water prices were needed just to be able to maintain current water quality standard, the acceptance, not surprisingly, somehow vanished. The local politicians obviously preferred to "sell" the deal to the voters: higher water prices in return for better service, - and this was one (implicit) assumption underlying their attitude.

This, in terms of political acceptability, is an example of Scenario 1 described above.

6.5 Political parties or a broader range of actors?

Political acceptance can be measured at two levels:

- At the level of formal policy makers; that means political parties and the elected deputies: what are the viewpoints of the political parties on water pricing.
- At the level of a wider group of political actors: parties, prominent interest organisations, the water industry, the relevant scientific community and public authorities. This makes it more demanding to get a grip of the actual level of political acceptability, but the results will be more solid.

The two possibilities are contrasted in Table 6.3.

Table 6.3 Arguments for focussing on either political parties or a broader range of actors

Focusing on political parties		Focusing on a broader range of political actors
It is more tangible and less demanding in terms of time and resources to analyse at this level as few actors need to be studied in-depth	but	the analysis may miss a lot of factors which, eventually, shape the priorities of the elected deputies, e.g. interests, groups, and authorities
Political parties are, in the end, the entities who make the decisions	but	the decision-making processes are often initiated, driven forward and steered by other actors than political parties, hence, political parties may only be mediators of interests
In principle, political parties cover all policy areas, hence, they can be expected to either have articulated a stance on water pricing or be willing to do so	but	many political parties will be reluctant to express a stance, for instance, if the case has not, a priori, been discussed internally in the party

We recommend that it should be considered, at an early stage of the analysis, whether the study can be limited to the political parties. If this is possible, there are major advantages to be gained in terms of simplicity of analysis and time savings.

Obtaining a convincing result requires that the water tariff issue has matured into a well-defined and well-known issue so that the political parties have taken a standpoint. Otherwise, the consultant runs the risk of asking questions to "ignorant" politicians.

6.6 Four levels of analysis

Analysis of political acceptability can be carried out in many different ways, regarding content and process of analysis, and four levels of analysis are outlined in Table 6.4. The levels should not be interpreted rigidly. There is room for combining elements from one option into another. For instance, elements of a policy network analysis can be integrated into less ambitious analysis. Each specific case requires its own design. It is the task of the consultant to tailor the analytic design of each case.

The levels are defined to be successively more ambitious and demanding to carry out but also giving still more accurate assessment of political acceptability. To analyse the attitudes of a limited number of political parties is relatively cheap and quick to do, but it requires that these parties do have a stance on the issue, and the predictability level of such an analysis will normally be low to moderate. To perform a policy network analysis, on the contrary, is resource and time demanding, but rewarding in the form of solid conclusions.

In general, level 1 or 2 is recommended because these levels allow the consultant to obtain an understanding of the political situation in a cost efficient way. Therefore, Section 6.7 and Section 6.8 spell out the suggested analysis for these two levels, while the additional analysis included in levels three and four is only indicated in Table 6.4 and Figure 6.3.

As a rule of thumb, political acceptability should always be addressed (at least by undertaking a simple version of the analysis) unless:

- The investor already has a great deal of knowledge on the political situation and the situation is deemed stable, and
- The procedures for setting water tariffs are firmly institutionalised via an institution that is difficult to alter, e.g. a piece of legislation.

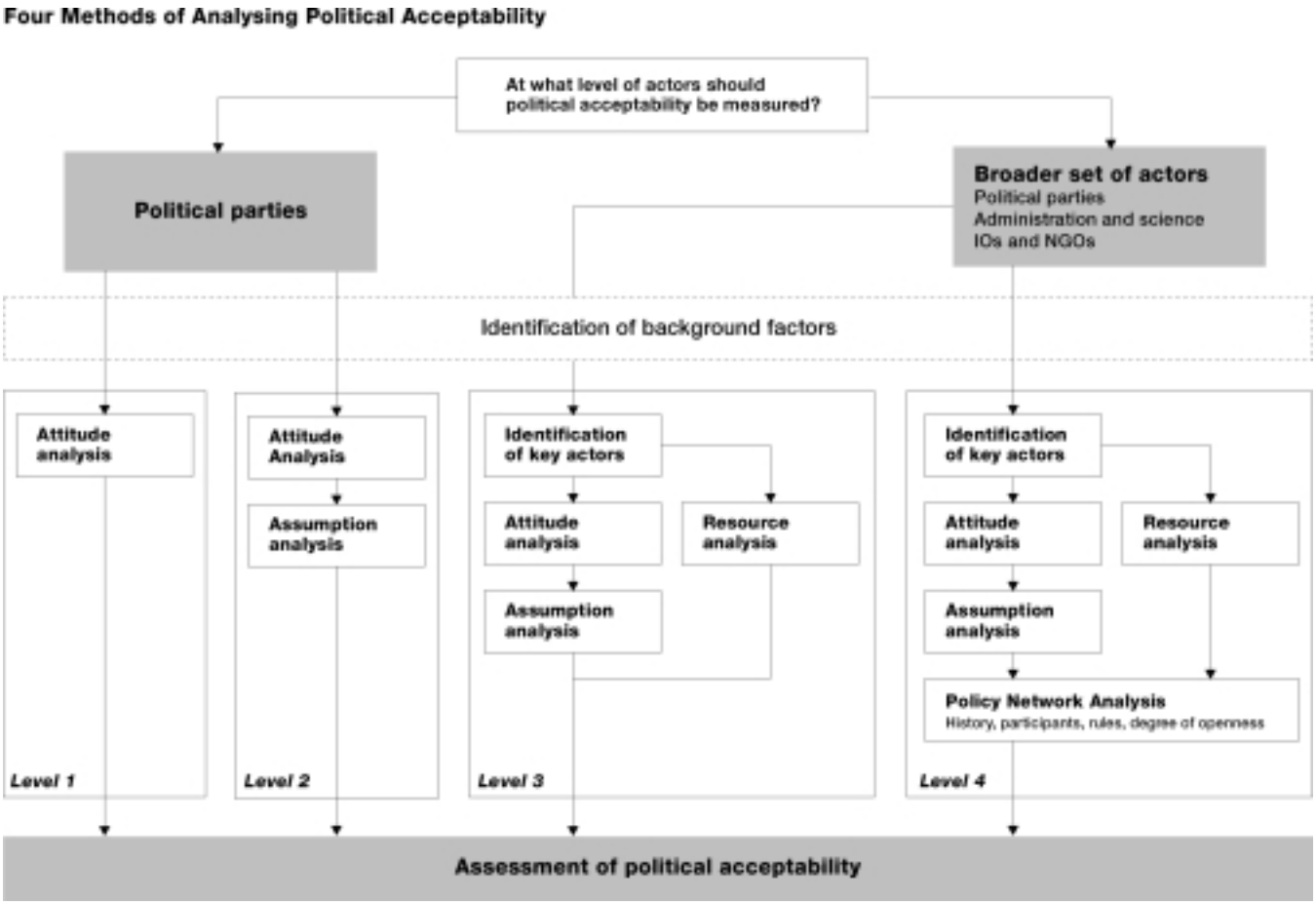
It would not be wise to exclude the analysis simply on the grounds that the decision-making authority rests with, say, a national board that seemingly is “sheltered” from local interests. In such cases, it should be documented that the board enjoys a great deal of autonomy and is likely to maintain its position.

More specifically, the importance of the political acceptability analysis differs depending on whether the project is a private-public partnership, such as a concession agreement, or a traditional investment project in a public utility.

For **a traditional investment project** in a public utility, the political acceptability analysis may be "nice to have" or "needed to have". This depends on how autonomous the water utility is, and thus the degree to which the consequences of the political decisions have to be borne by the political system itself or by an independent water utility.

For **public-private partnership** with an autonomous private sector partner, the political acceptability analysis will be "needed to have". For a concession agreement, BOT or similar, the optimal timing is likely to be at the pre-feasibility stage. An early analysis leaved more time to address the critical issues identified at an early stage. Since it is an expensive process to bring a PPP arrangement to closure, early identification of critical political acceptability issues is cost-effective. As a minimum, the analysis should be completed and reported simultaneously with the announcement of the selected short list of firms invited to submit a bid for the concession, BOT etc. The short-listed firms will find it highly useful to have an indication of the political acceptability of alternative solutions in order to assess, inter alia, their revenue risk.

Figure 6.3: Four methods of analysing political acceptability



22 As these analyses, by nature, cover delicate matters, some actors may be reluctant to participate.

Table 6.4: Comparison of the four levels

	Level 1 Attitudes of political parties	Level 2 Attitudes and assumptions of political parties	Level 3 A broader range of actors	Level 4 Policy network analysis
	Background factors	Background factors	Background factors	Background factors
Content of analysis	Attitudes of political parties	Attitudes and assumptions of political parties	Attitudes, assumptions, and resources of a range of actors	Attitudes, assumptions and resources of a range of actors & analysis of the policy network related to water tariff policy making
Output of analysis	The level of acceptability	The level and stability of acceptability	The level and stability of acceptability based on analysis of each actors' ability to influence the policy process: whose attitudes are likely to prevail	In-depth understanding of acceptability via identification of the policy network (history, actors, rules, interests, influence) and policy development in the water sector.
Level of predictability	Low (in most cases)	Low-moderate	Moderate	Moderate-high
Accessibility of information	Good	Good	Mostly good, sometimes difficult[22]	Mostly good, sometimes difficult[22]
Data sources	Interviews with political parties, party programmes and statements	Interviews with political parties, party programmes and statements, a range of information to assess the assumptions (technical, statistical, economic, political surveys)	Interviews with political parties and other actors, interviews with local social scientists, programmes, annual reports, list of members.	Interviews with political parties and other actors, interviews with local social scientists, interviews with case workers (civil servants) programmes, annual reports, administrative files

In the remaining part of this chapter levels 1 and 2 are described in detail, whereas only the principles of levels 3 and 4 are outlined. This approach is chosen because often levels 1 and 2 will suffice, possibly with elements of levels 3 or 4 included. The figure gives an overview of the content and flow of each level.

6.7 Attitudes of political parties

This section describes the tasks required for an assessment of political acceptability via an analysis of the attitudes of political parties. The merits of this design are:

- It is easy and relatively cheap to conduct the analysis;
- Approaching the political parties can give a very decent understanding provided that the issue of water tariffs has emerged as a salient issue meaning that the parties either already have or are prepared to express an attitude.

[23] A guide to screening of key actors has been provided in Appendix 10.

The structure of the analysis is presented in Text Box 36.

Text Box 36: Assessing political acceptability via analysis of the attitudes of political parties

- Consider whether it is sufficient to delimit the analysis to political parties (Section 6.5)
- Involve local expertise (Section 6.7.1)
- Identify the relevant political parties. Arrange and conduct interviews with prominent representatives of each party (Section 6.7.2)
  - prepare semi-structure interview guide, taking the list of background factors into consideration
  - provide interpreters
  - Prepare minutes of interviews
- Compile complementary information (in writing) that expresses the view points of the parties (Section 6.7.3)
- Assess the political acceptability (Section 6.7.4)
  - Consider relevant background factors
  - Make distinctions between ruling parties and parties in opposition
  - Make distinctions between the degree of acceptability expressed

If the parties do not have clear-cut opinions, it is not sufficient to only consult the parties. In this case, it may be necessary to screen the policy field and to identify the key actors and analyse their attitudes[23]. Compared to level three, the analysis suggested here not only covers less actors, but it also does not seek to capture the resources on which the actors can draw on when water tariff setting becomes an issue. An investigation of resources could enable the consultant to indicate the outcome of the water tariff issue as it will be possible to distinguish between, say, stronger and weaker actors. Then, the overall picture may change.

Text Box 37: Kaliningrad: Difficult to assess acceptability via interviews with the politicians because the water tariff issue was not well defined

This was the case in Kaliningrad, autumn 1999. It turned out that water pricing had not become a well-defined political issue, meaning that it did not make sense to assess acceptability only by consulting the political parties, as they could merely articulate a general statement. Other actors would, therefore, have to be consulted to get a decent understanding of acceptability.

This was an example of circumstances dictating the choice of analytical design as some options appeared to be insufficient.

If the more ambitious approach is chosen, the actors should be described and mapped in terms of resources, i.e. political, economic and legal resources as well as cognitive, strategic and argumentative resources. Using the resource mapping it is possible to distinguish between strong and weak actors as well as the types of actors.

6.7.1 Involvement of local expertise

Local expertise should be involved from the very beginning of the analysis.

When preparing the interviews, it is relevant to have a local assistant compiling various background materials. This includes party programmes and statements, election programmes, etc. in which the parties may have forwarded principal standpoints on e.g. environmental matters (water quality), the application of the cost-recovery principle in the provision of environmental services, social concerns, etc.

The project assistant must also be asked:

- To detect and compile other background material;
- To assist in tracing the historical milestones on the development of the local water policy;
- To compile relevant theoretical and empirical descriptions of the local public administration and political context;
- To assist in the reporting and interpretation of interviews.

6.7.2 Arrange and conduct interviews

Preparing, conducting, and reporting on interviews should follow general standards for qualitative research. The following points should, as a minimum, be remembered:

- A prominent representative of the political party should be approached; one who is able and willing to describe the party's policy in detail;
- Make sure that this person represents the official stance of the party, for example, by cross-checking with another party representative;
- Get a clear understanding of whether or not the issue has been thoroughly debated within party circles. Does the party e.g. have a written declaration covering the water tariff issue?
- Get a clear understanding of whether the water tariff issue is a crucial or marginal issue to the party (and why);
- Be able to detect and describe the principal line of reasoning. On what general principles does the party base its standpoint on water pricing (e.g. purely pragmatic, a trust in market mechanism, social concern, perception of borderlines between public and private obligations in the provision of municipal services, etc.).

At the completion of each interview, ask the person to think of useful sources of information (other persons to interview, written materials, etc.).

The interviews can be partly standardised. It is, therefore, recommended to prepare and apply a semi-structured interview guide.

6.7.3 Compile additional information

After a round of interviews with the political parties and before drawing conclusion, it may be necessary to include a number of additional interviews with the political parties to clarify potential misunderstandings, etc. It will also be relevant to confront local social scientists with the results so as to get a better contextual understanding of the information collected.

6.7.4 Assessing political acceptability

The assessment must be based on i) the background factors and ii) interview-based information. The consultant should, obviously, seek to interpret the findings in the light of the background factors. When assessing acceptability based on a relatively "quick" screening of attitudes, it is recommended:

- To be careful not to draw too far-reaching conclusions.
- To make clear to the reader that the dynamics of water tariff policy making have not been captured; instead, the analysis only gives a static snapshot presentation of the situation.
- To distinguish between ruling parties and parties in opposition and to comment on how a change in municipal government may influence the acceptability.

6.8 Attitudes and assumptions of political parties

This section describes the analysis required for an assessment of political acceptability via an analysis of the assumptions underlying the attitudes of political parties. The key questions are whether the assumptions are fragile or solid? What happens to the level of acceptability if assumptions prove inadequate?

This study is relatively easy to undertake but it adds a lot to the attitude analysis by clarifying the nature of the acceptability level; foremost, whether the given level of acceptability is stable or non-stable.

The structure of the analysis is presented in Text Box 38.

Text Box 38: Assessing political acceptability via analysis of the attitudes and assumption of political parties

- Consider whether it is sufficient to delimit the analysis to political parties (see above Section 6.5)
- Involve local expertise (Section 6.7.1)
- Identify the relevant political parties and arrange interviews with prominent representatives of each party (6.7.2)
  - prepare a semi-structure interview guide, taking the list of background factors into consideration
  - provide interpreters
- Conduct interviews and prepare minutes of interviews (Section 6.8.1)
- Compile complementary information (in writing) that expresses the view points of the parties, etc. (Section 6.7.3)
- Describe and analyse key assumptions (Section 6.8.2)
- Assess level and stability of the political acceptability (Section 6.8.3)
  - Consider relevant background factors
  - Make distinctions between ruling parties and parties in opposition
  - Make distinction between the level of acceptability and the stability of acceptability

6.8.1 Conduct interviews

In addition to the comments given in Section 6.7.2, it should be stressed that the interviews should be prepared and conducted bearing in mind that they must be able to reveal the "hidden" assumptions. This makes it particularly important that the consultant keeps asking about the assumptions on which the attitude is based.

6.8.2 Describe and analyse assumptions

An attitude always rests on assumptions and perceptions, but these are seldom made explicit. The purpose of this analysis is, exactly, to make the assumptions explicit and to assess their relevance for the stated level of acceptability.

Examples of underlying assumptions could be that acceptance is high, provided an alteration of water tariffs will facilitate EU approximation, or provided that these changes are a prerequisite for further donor assistance.

We propose the following process:

- Conduct interviews;
- Discuss the assumptions with the persons interviewed;
- Describe the assumptions;
- Assess whether the assumptions are stable and assess the implications for acceptance in case they are not met in the future.

Table 6.5 gives an example of how to structure the assessment.

Table 6.5: Example of a structured presentation of assumptions

	Attitude to increased water tariffs	**Assumption**	**The stability of the level of acceptability expressed**
Political party A	Positive	Additional revenue will finance renewal of e.g. wastewater treatment facilities	Depends on whether revenue is linked to investments in wastewater treatment facilities
Political party B	Negative	Undesirable distribution effects of increased tariffs	Depends on analysis that can reveal distribution effects

6.8.3 Assessing the level and stability of political acceptability

Scrutinising the assumptions will give a better understanding of acceptability as the consultant comes to know not only the **level** of political acceptability, but also the **stability** of political acceptability.

As already mentioned, stability refers to whether the attitudes rest on key and probably fragile assumptions. The consultant should evaluate the assumptions including their significance vis-à-vis the attitude expressed, and estimate the likelihood of relaxing those assumptions that are not absolutely fixed.

By explaining which of the four scenarios the particular case resembles, the consultant can reflect on how a potential investor should approach the situation.

When assessing the stability, the consultant should also keep in mind whether the water tariff issue is crucial or marginal to the party. If marginal, the party will be more willing to change its position.

It could thus, a priori, be assumed that the more crucial the issue is to the party, the more stable its position will be. This dimension should be incorporated in the assessment.

Text Box 39: Brno: EU membership stands out as the dominant assumption

The case study in Brno revealed that, for the political parties, the long-term objective of EU membership is one of the main motivations for carrying out investments in the water supply and wastewater sectors. This is a key assumption and a stable one, too.

Public opposition would have to be very substantial before it became a more important issue for policy makers than meeting the requirements of EU membership.

6.9 Analysing a broader range of actors and/or policy network analysis

If the analysis illustrates that the assumptions are fragile, and if there is reason to believe that the success of the project will critically depend on an adequate assessment of political acceptability, there is an argument for conducting a more broad and in-depth analysis. It is recommended that such a decision be made on a case-by-case basis.

Figure 6.3 and Table 6.4 indicate the key issues which are raised as part of a so-called policy network analysis. This type of analysis has not been described in detail in the toolkit as we have assumed that a decision on whether to conduct such an analysis will be taken on a case-by-case basis. The policy network analysis combines analysis of the attitudes and resources of the key actors with a presentation of the rules – formal as well as informal - that steer the relevant water policy network, thereby increasing the predictability level.

The policy network approach can help us focus attention on a description of those actors who have, now and historically, determined the water policy, as well as an assessment of whether the network resembles a policy community or a loose issue network. In order to do this, the historical development is analysed as background material, and the interests of the network members are analysed.

6.10 Reporting

It is recommended that the political acceptability analysis be reported in a separate working document or a separate chapter in the report on acceptability of water prices.

As a minimum, the chapter should include the following subsections:

- Background factors
  - the link from public acceptability to political decisions on investments and enforcement of tariffs;
  - the procedure for water tariff setting;
  - other factors identified as important (consider all those in table 6.2, as a minimum).
- Level of political acceptability
  - based on an assessment of the attitudes of the political parties
- Stability of political acceptability
  - based on assessment of the assumptions of the political parties
- Conclusion
  - highlighting any issue that may be critical to acceptance of the proposed investment tariff level or institutional change (e.g. introduction of a concession).

CHAPTER 7
SMALL TOWN TOOLKIT

7.1 Introduction

For a small investment, it may not be financially feasible to use the full set of tools proposed above. In this case, it is proposed to use a limited version. The purpose of this chapter is to suggest the sub-set of the full toolkit which is appropriate for small investments. Therefore, this chapter refers extensively to the preceding chapters.

A simple rule as to when to use the full set of tools and when to use the Small Town Toolkit is not easily made, as it depends on the size and risk profile of the investment. However, it is suggested to use the Small Town Toolkit where the investment is less than 5 million EUR. The larger the investment, and the higher the risk associated with the expected increase in tariffs, the more important it is to use the full set of tools in order to get a better understanding of willingness to pay, affordability and political acceptability.

In particular, the following aspects should affect the choice of whether to use the Small Town Toolkit or the full set of tools:

- The scope of the envisaged tariff increase that has to be accommodated when undertaking the investment. The larger the tariff increase, the greater the need to understand the issues of willingness to pay, affordability and political acceptability in depth.
- The width of possible technical solutions and service levels. The broader the range of possible technical solutions, service levels and resulting investments, the greater the need to understand the issues of willingness to pay, affordability and political acceptability in depth.

There is room for expanding the minimum set of tools suggested in this chapter with the use of additional tools, such as "the stated preference analysis", that may be deemed appropriate for the investment project in question. The specific approach adopted must be chosen with due consideration of the factors mentioned above.

This section elaborates on the rationale and approach of the Small Town Toolkit. It proceeds to suggest when to fit the analysis proposed into the project cycle. Finally, the standard set of tools is presented which is proposed for small investments.

7.1.1 Approach of the Small Town Toolkit

The tools recommended for the Small Town Toolkit are specified in Table 7.1.

Table 7.1: Overview of topics and tools of the Small Town Toolkit

Topic	Tool	Relevant section
The toolkit and the planning process	The integrated approach	Section 7.1.2 Chapter 2
Technical, service and expenditure baseline	The technical profile summary	Section 7.2 Chapter 3 Appendix 3
Customer perceptions, willingness to pay and demand	Qualitative research approach Generic topic guide	Section 7.3 Section 4.5 Appendix 4
Household affordability	Affordability analysis using macro data, household survey data and qualitative research	Section 7.4 Section 5.3 Section 7.5
Political acceptability Terms of reference	Analysis of attitudes of political parties Standard TOR for pre-feasibility/ feasibility study	Section 6.7 Appendix 2

The method to establish the **technical, service and expenditure baseline** is basically the same for small towns as that for large cities, and the technical and service characteristics must be described using the same variables. However, there are some differences that are discussed in Section 7.2.

As to **customers' perception and willingness to pay,** the Small Town Toolkit consists of the qualitative research, only. Important information on the consumers' attitude towards water and wastewater services is gained from conducting in-depth interviews and use focus groups.

As to the **affordability analysis,** it is recommended to conduct the research on aggregated data, e.g. for the region, and to take a qualitative approach to the household affordability analysis.

Finally, it is recommended to conduct the **political acceptability** analysis by analysing the attitudes of political parties.

Resources required

The level of effort required for the analysis will depend on the characteristics of the project. To carry out the analysis suggested for the Small Town Toolkit, a total number of two specialist months and two and a half calendar months will be required, cf. Table 7.2.

Table 7.2: Resources required for the Small Town Toolkit

	Person weeks	Calendar weeks
Technical, service and expenditure baseline	1-2	4
Customer perception, willingness to pay and demand for water	2-3	4
Household affordability	1	2
Political acceptability	2	4
Total	6-8	10

Disclaimer: The resource requirement has been estimated by COWI and is not necessarily endorsed by DEPA or EBRD

7.1.2 The Small Town Toolkit in the project cycle

The suggested timing of the tools follows the full toolkit. The figure below presents an overview of each of the tasks for which tools are provided in the Small Town Toolkit and the suggested timing in the project cycle.

Figure 7.1: Overview of Small Town Toolkit task and their timing in the project cycle

Text	Chapter ref.	Month 1	Month 2	Month 3
Assess current service, condition & operations	Section 3.3			
Specify targets for future service	Section 3.4			
Assess cost of future service	Section 3.5			
Prepare willingness to-pay-analysis	Section 4.3			
Determine issues	Section 4.4			
Undertake qualitative survey	Section 4.5			
Affordability analysis using macro data	Section 5.3			
Qualitative approach to household affordability	Section 5.7			
Attitudes of political parties	Section 6.7			
Key meetings with municipality / project sponsors				

Legend

Pre-feasibility/Feasibility

In Figure 7.1 we have assumed that, for "small towns", the pre-feasibility and feasibility stages are carried out jointly following project identification. If this is not the case, the overview of timing shown in Figure 2.3 applies. Furthermore, as a result of the longer calendar time spent when the pre-feasibility and feasibility stages are carried out separately, the resource use for the Small Town Toolkit, in this case, is likely to be in the higher end of the interval given in Table 7.2.

7.2 Technical, service and expenditure baseline

The technical and service characteristics must be described using the same variables as described in the technical profile summary in **Appendix 3.** However, the assessments of appropriate service level and acceptable future expenditure differ in small towns compared to large towns.

In many small towns in the CEE, the target formulation for the project is often coming from the "outside of the town"; either as part of a national development programme or as part of a programme to meet an international obligation. In particular in the EU candidate countries, the objective of the project is often coming from the need to adhere to the EU environmental acquis.

National policies in the water and wastewater sector in several countries (e.g. Hungary and Lithuania) seem to set a high level of ambition in terms of service targets for small towns partly with reference to EU accession. Preparation of projects with substantial foreign contributions (e.g. ISPA grants) is typically done for "batches" of small towns in order to achieve economies of scale in project preparation and meet minimum donor requirements for project cost. However, this method of preparation has a tendency to lead to standardised approaches with a considerable element of foreign technology in the solutions. Therefore, for small towns we recommend a particular focus on the choice of service level and appropriate technologies.

The technical analysis should:
- Assess current service level, condition and operations.
- Specify targets for future service.
- Assess expenditure needs of alternative future service levels.

These issues are described briefly below and further elaborated in Chapter 3.

7.2.1 Assess current service level, condition and operations

The technical and service characteristics can be described by the variables in the technical profile summary, cf. **Appendix 3,** and these data should be collected. The data sources are existing reports where available, supplemented with data collected from the water utilities through a simple questionnaire and discussions.

The current water and wastewater system, its condition and the overall service level, should be described based on a collection and assessment of the data, supplemented with discussions and selected sample visits to a limited number of facilities.

7.2.2 Specify targets for future service

Based on the assessment of the current situation, realistic scenarios for future service levels should be made, including a without the project and a with the project scenario.

When specifying the targets for future services, it is particularly important, in small towns, that the following issues be thoroughly considered:
- What are the perceived water and wastewater service problems as seen by the customer?
- What are the objectives of the main sponsor, e.g. national government, foreign donor?
- Do the proposed service target and the technical solution reflect the objectives of both the customer and the main sponsor in a cost-effective way?

This is to ensure that the selected target services fulfil both the preferences of the customers and the demands coming from outside of the town.

Text Box 40: Appropriate technology in Kivioli, Estonia

As part of an environmental project for small towns in Estonia, one of the main problems related to wastewater in the town of Kivioli have been identified as:

1,600 inhabitants (20%) living mainly in single family houses have neither sanitary nor storm water sewers resulting in shallow well contamination and increased risk of drinking water contamination due to infiltration of contaminated groundwater into the water pipes.

Therefore, it became a project objective to increase the wastewater collection rate. Alternative technical solutions to the drinking water problem ought to have been investigated prior to reaching the conclusion to increase wastewater collection from single family houses in this small town. As a result, it is not known whether the technology suggested is "appropriate".

7.2.3 Assessment of expenditure needs of alternative future service levels

The necessary tariff revenue depends on the expenditure needs. The assessment of expenditure needs is as difficult for small towns as it is for large cities. If data is unavailable, the estimates have to be based on engineering judgement. There are two cost components of the expenditure needs, resulting from:

- Operation and maintenance; and
- Investments and their funding.

It can be assumed that the tariff revenue should finance the annual expenditure need. The annual expenditure need can be estimated as the sum of the annual operation and maintenance expenditure and the annualised investment costs.

Hence, in order to be able to calculate the expenditure need and the tariff increase, the operation and maintenance cost and the cost of investments should be estimated.

Operation and maintenance

The implications of the investment for future operation and maintenance expenditures, and whether the expenditures can be recovered through user charges should be determined.

In the CEE, the expenditure need arising from daily operations can typically be assessed based on information given in the accounts.

In the CIS, it may be difficult to obtain good estimates of the proper expenditure need arising from daily operations. If the maintenance expenditure need has to be estimated on the basis of engineering judgement, the estimate may be supported by information from other studies, cf. Chapter 3.

Investments and their funding

The sources of data for the required costing of investments include existing project reports, where available, existing investment plans provided by the service provider, etc.

In most cases, the municipality or the service provider will have investment plans for the required rehabilitation and expansion. It is, however, important to assess such plans carefully in relation to the target.

In cases where no reliable investment plans are available, the technical team will have to assess investment levels based on sound engineering practice, taking the technical profile summary as the entry point. Rough rules of thumb and reference to generic cost functions will do, at this stage.

As part of the work, it should be considered whether the small town will be able to finance file replacement of infrastructure when it is worn out.

7.3 Customer perceptions, willingness to pay and demand for water services

Due to small size of the projects, it is normally not financially efficient to carry out willingness to pay assessment through a stated preference survey. Still, it is important to solicit the customers' view on the baseline service level, their perception of problems and their attitude toward future service change options. The key issue for small towns is to match customer perceptions of service level, environmental and health issues with regulatory requirements - typically searching for a minimum cost solution.

Text Box 41: Tap water in Viljandi, Estonia

In Viljandi, the lack of tap water of a reasonable quality is a widespread problem, and it is considered to be a main issue for local residents. On the other hand, the contamination of groundwater and surrounding sensitive water bodies is of minor interest to the public except for the 14 % of the population utilising groundwater. This may be contrasted with the cost ratio of the planned investment: 30% for water and 70% for wastewater investments.

Thus, it seems that the residents focus on water supply quality issues, whereas the major investment cost is for (largely unrelated) wastewater and pollution abatement. Without proper information efforts, this might cause difficulties for tariff increases, when the local population realises that the investment costs do not reflect their priorities.

In small towns, the qualitative part of the methodology outlined in Sections 4.4 and 4.5 can be used for the assessment of customer perception of service level issues. The work includes:

- The determinants of willingness to pay.
- Qualitative analysis of the willingness to pay.

The tasks are discussed briefly below and elaborated further in Chapter 4 above.

7.3.1 The determinants of willingness to pay

The main determinants of willingness to pay are the perceived quality of water and wastewater services, household income and the current price of water and wastewater services.

In addition, the willingness to pay is influenced by a number of factors, such as the history of price and service levels, affordability, the effectiveness of public relations, public awareness of environment and public health issues, cf. Chapter 4. These are issues that might be considered when analysing the willingness to pay. The relative importance of these issues may be assessed by:

- Undertaking qualitative background research
- Meeting the relevant people

The relevant issues can be determined by undertaking background research in order to understand the realistic technical options, billing and payment collection, as well as the socio-economic context.

It is recommended to interface with financing and engineering experts of the service provider in question (or consultants) in order to understand the constraints (and possibilities) faced by the service provider. Access to policy makers (or a socio-economic expert) may provide an understanding of the socio-economic context in which the service provider works.

7.3.2 Qualitative approach to willingness to pay analysis

Important information on the consumers' attitude towards water and wastewater services is gained from conducting in-depth interviews and using focus groups.

The qualitative research comprises structured interviews or discussions with a sample of users in order to determine the important factors as perceived by the users and their willingness to pay the proposed services. The size of the sample for qualitative research is small, say approximately 10 - 20 people. The sample for qualitative research should cover representatives of the major seg-ments of the users as well as different geographical areas within the area of service provision.

The qualitative research can be conducted as in-depth interviews or focus group discussions. In-depth interviews are face-to-face and conducted with respondents in a suitable, comfortable environment. A programme of 6-12 interviews is required. A focus group consists of a group of typically eight respondents. One focus group is often sufficient, and the discussion can last approximately 2 hours.

The focus group can be moderated either by a member of the market research team, if necessary with consecutive translation of questions and simultaneous translation of responses, or by a local expert with the market research team watching and following the discussion through translation of questions and answers, cf. Chapter 4.

Text Box 42: Willingness to pay in Kaliningrad

The participants in the focus group in Kaliningrad were asked if they would be willing to pay 20% more / 100% more if water was supplied 24 hours a day with good water pressure, no smell, completely clear and drinkable direct from the tap. All participants preferred to pay 20 % extra for the improved service, but most participants where unwilling to pay 100% extra.

This gave an indication of a moderate willingness to pay. The following quantitative research affirmed this hypotheses, and the conclusion of the qualitative work was not rejected.

For both in-depth interviews and focus group discussions, a financial incentive for the participation should be provided (equivalent to approximately two hours' wage income or 2-15 EUR).

Both the in-depth interviews and the focus groups use a topic guide. The content of the topic guide will depend on the local circumstances as elicited from the terms of reference and discussion with relevant people, cf. chapter 4. A generic example of a topic guide is included in Appendix 4.

Following the in-depth interviews or focus group discussions, the consultancy team will meet to discuss the findings. This process involves going through the written notes from all the interviews and focus group discussions, topic by topic to assess the importance of each topic area and the willingness to pay for improvements.

7.4 Household affordability

The affordability analysis can be carried out in the same way as for larger towns if town specific income and expenditure data can be retrieved from statistical data. Regional statistical surveys may provide a good starting point for an assessment of income and expenditure levels in small towns in the region. If reliable data cannot be obtained, it may be helpful to conduct a simple expenditure survey.

Three approaches are suggested for small towns:
- Analysis using macro data.
- Analysis using household survey data.
- Qualitative assessment.

The qualitative assessment is called for if no data is available or as a supplement to data of low quality. These three approaches are described briefly below, and the analysis of macro data and household expenditure data is further elaborated in Chapter 5.

7.4.1 Analysis using macro data

Analysing macro data can be conducted at a relatively low cost if the data is readily available, cf. Section 5.3. For small towns, data may not be available for the specific town but only for the region, and there may be differences in income levels within the region. Thus, when such data is available, the consultant should carefully consider whether the sample used is representative of the small town in question.

In order to conduct the analysis, the following data is useful:
- Cost of water.
- Income data.
- Expenditure data.

It is useful to establish an average measure of the cost of water, such as the typical cost of water services as a percentage of average income. This measure should be supplemented with measures that take income distribution explicitly into account. If income distribution data is available, and water expenditure is known by income group, the share of income used for water services can be estimated for each income group.

7.4.2 Analysis using household survey data

Household survey data may be available from previous reports, and such data may be useful even when the aim of the previous work differs from that of the present analysis.

An alternative to depending on existing data, is to carry out an expenditure survey. For one small town, this is likely to entail excessive use of resources. However, if a project is designed to cover a large number of small towns, say 10-15, carrying out an expenditure survey may be a possible

24 See a discussion of this in Chapter 5.3.

approach. In this case, the survey should be designed to deal with any major biases between towns, for example by pooling towns according to size, geographical location, employment structure or other a priori determined variables relevant for stratification.

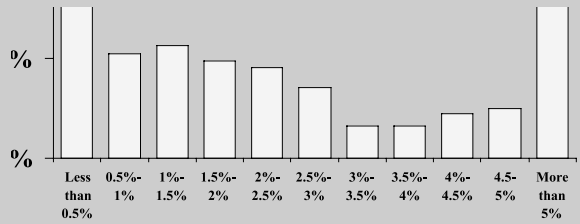
If data on household expenditures is available or an expenditure survey has been conducted for the purpose, it is possible to obtain better insight in the households' economic situation, cf. Section 5.5. Two useful measures are water expenditure as a percentage of household income and the share of household income that is used for food. With detailed data on household income and household expenditure on water and wastewater services, it is possible to analyse the distribution of water costs across households.

Finally, the composition of expenditure provides important information on affordability. If the average spending on food approximates 70%, there is likely to be a problem of affordability[24]. Expenditure data can also reveal if there are changes in the distribution of the expenditure over time, e.g. an increasing share may be allocated to necessity goods such as food, heat, water, gas and electricity.

Text Box 43: Cost of cold water and sewage in Ukmerge, Lithuania

The survey in Ukmerge was carried out in October 1999 to investigate the households' demand for environmental services. The survey includes both questions on water cost and household income, and hence, it is possible to estimate the distribution of the share of income that is used for water services.

As seen in the figure below, almost every sixth household pays more than 5 per cent of the household income for water services. This indicates that there is a problem of affordability for this group, especially if tariffs are increased further.



Cost of water services as a percentage of household income

Note: The survey included 500 respondents, 406 of them replied to the questions both on water cost and household income. The figure includes 61 respondents who indicated that they do not pay for water services.

Sources: Rinkos Tyramai, Vilnius.

7.4.3 Qualitative assessment

If no data is available, an affordability assessment may be based on structured interviews with staff of the local administration dealing with social assistance programme.

Qualitative interviews with a limited number of customers can also provide useful information. In addition, a trained economist with knowledge of the economy in question may be able to assess the level of income based on a structured assessment of the type of transport equipment in use, the clothing of the population and the selection of products in the shops. However, both methods should only be used if no other opportunities are available and the results should be interpreted with caution.

Text Box 44: Affordability in Borovichi

The affordability analysis in Borovichi was carried out based on an interview with the Department for Social Affairs in Borovichi City Administration, interviews with six customers and observation of goods and prices in Borovichi. The conclusion is that the inhabitants can afford to pay a higher water tariff.

The department provides statistical information on income and social assistance and can give a general impression of the standard of living. The information gives the impression that Borovichi is a comparatively poor society.

Six individual families were selected and their patterns of consumption were analysed. The sizes of families and income levels were typical for the population in Borovichi. The results of the interviews were that the six typical families were able to pay more for the water services.

Finally, the selection in the shops was evaluated in terms of prices, quality and necessities. There is no lack of food in the shops, but the food is basic including all kinds of cheese, yoghurt, but not expensive meat. Prices are, in general, high (relative to income) except for grain, flower, pasta and bread. Meat prices are high. Shoes are expensive. The clothes sold are, generally, old-fashioned and inexpensive. Fur coats can be purchased in the shops and are not uncommon in the street. Foreign products are available in all shops, but there are few Western cars (no more than 10%). Finally, there are few beggars in the streets.

Source: Based on a feasibility study by Carl Bro Management (2001)

7.5 Political acceptability

7.5.1 Attitudes of political parties

In small towns, it is suggested to carry out the attitude analysis by interviewing political party representatives. This analysis is relatively cheap to conduct, and the approach can give a good understanding as to whether water services and tariffs have emerged as a political issue.

The analysis proposed for small towns corresponds to level 1 described in Chapter 6. This includes

- Involvement of local expertise.
- Interviews with the relevant political parties.
- Compilation of complementary information.
- Assessment of the political acceptability.

The four points are briefly described below and further elaborated in Section 6.7.

7.5.2 Involvement of local expertise

When preparing the interviews, a local assistant should compile background materials. This includes party programmes and statements, election programmes etc. in which the parties may present principal points of view on, for example, environmental matters, the application of the full cost-recovery principle in the provision of services, social concerns, etc.

7.5.3 Interviews with the relevant political parties

The relevant political parties should be identified. A prominent representative of each political party should be approached. The representative should be able and willing to describe the party's official stance and policy in detail. The interview should clarify whether or not the issues have been thoroughly debated within party circles. If the party has relevant written declarations, for example covering the water tariff issue, a copy should be secured.

The interview should detect the principal line of reasoning. On what general principles does the party base its standpoint on water pricing? Purely pragmatic? A trust in the market mechanism? Social concerns? Perception of the borderlines between public and private obligations in the provision of municipal services? etc.

It is recommended to prepare and apply a semi-structured interview guide.

7.5.4 Compilation of additional information

After a round of interviews with the political parties and before drawing any conclusions, it will be relevant to confront a local social scientist with the results so as to get a better contextual understanding of the information collected.

7.5.5 Assessment of political acceptability

The assessment must be based on the background factors and the information obtained through interviews. The consultant should seek to interpret the findings in the light of the background factors. It is important to distinguish between ruling parties and parties in opposition and to assess how a change in municipal government may influence the level of acceptability.

When assessing political acceptability based on the relatively quick screening of attitudes, it is recommended to be careful not to draw far-reaching conclusions.

Appendix 1: List of Literature

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Appendix 2: Proposed Components to Include in the TOR for a Water Services Project: Analysis of Acceptability of Water Prices

Introduction

The purpose of this annex is to provide generic input to Terms of Reference for studies that include assessments of willingness to pay, affordability, water demand, and political acceptability only.

These proposed standard components are sector specific for the water supply and wastewater sector. The annex is not intended to be a full draft set of terms of references. The components are intended to be included in a feasibility study for a traditional investment project or in the set of studies made in preparation for a public-private partnership as appropriate.

The reader will find three typographies:
"Text in Frutiger 45 Light 8.5 points". Text in Frutiger 45 Light 8.5 points, may be copied directly to the (pre-)feasibility TOR being prepared.
{TEXT IN BRACKETS} Within "Text in Frutiger 45 Light 8.5 points" you may find text in brackets for example: {ENTER NAME OF "MUNICIPALITY" HERE}. This is intended to be replaced as explained in the bracket.
TEXT IN CAPITALS is intended as explanatory text. The text suggests issues that need to be covered by the study. This text may be deleted after verification by the author of the specific TOR.

The generic input provided relates to the following paragraphs typically found in TOR for water and wastewater project preparation studies:

- Introduction and background
- Objectives
- Scope of work
- Time schedule, manning and outputs

TOR can also include a number of other sections. However, the above listed sections are the typical core sections of TOR for project preparation studies.

Issues to include in the TOR section "Introduction and background"

EXPLAIN THE LINK BETWEEN THE ENVIRONMENTAL PROBLEM IDENTIFIED AND THE NATIONAL REGULATION AND INTERNATIONAL AGREEMENTS AND EXPLAIN HOW THE PROJECT IDEA MAY IMPROVE THE SITUATION.

IDENTIFY RELEVANT NATIONAL INVESTMENT PROGRAMMES AND PROVIDE AN OVERVIEW OF THEIR SIZE. EXPLAIN THEIR KEY IMPLEMENTATION MODALITIES (IF DEEMED TO BE RELEVANT TO THE INVESTMENT PROJECT).

IDENTIFY AND LIST KEY NATIONAL MONOPOLY CONTROL, TARIFF AND OTHER PERTINENT FINANCIAL REGULATION. DETERMINE WHICH AUTHORITIES HAVE THE DISCRETIONARY POWERS.

DESCRIBE THE ORGANISATIONAL SET UP FOR COLLECTING WATER QUALITY DATA (RAW WATER, POTABLE WATER AND WASTEWATER) AND APPROVAL OF APPLICATIONS FOR WATER SUPPLY, WASTEWATER DISCHARGE AND SLUDGE HANDLING .

DESCRIBE THE ORGANISATIONAL SET UP OF THE MUNICIPAL WATER AND WASTEWATER ENTERPRISE (INCLUDING OWNERSHIP STRUCTURE, REPORTING REQUIREMENTS, ORGANISATIONAL LINKS, SUB-CONTRACTORS).

LIST THE KEY NATIONAL AUTHORITIES INCLUDING FOR EXAMPLE MINISTRY OF ENVIRONMENT AND / OR STATE COMMITTEE OF HOUSING AND CONSTRUCTION AND / OR MINISTRY OF LOCAL GOVERNMENT. DESCRIBE THE ROLES OF THESE AUTHORITIES IN RELATION TO THE WATER AND WASTEWATER SECTOR.

IDENTIFY KEY STAKEHOLDERS AT PROJECT LEVEL, IN ADDITION TO THOSE MENTIONED ABOVE. THE RESPONSIBLE FINANCING (SEE ABOVE) AND EXECUTING INSTITUTIONS MUST BE INCLUDED.

IDENTIFY KEY CONSTRAINTS TO FINANCIAL AND OPERATIONAL AUTONOMY TO BE REVIEWED IN THE FEASIBILITY STUDY.

Generic input to TOR section on "Objectives"

The overall objective of the public acceptability analyses included in the present study is to assess an appropriate and feasible level of service and tariffs taking into account the need to comply with national and international regulations.

The specific objectives of the public acceptability analyses are:

- To determine the affordability and willingness to pay amongst households for specified service changes or for maintaining the present service avoiding deteriorating of service;
- To determine the political acceptability of tariff increases;
- To determine the demand impact of changed service level and tariffs;
- To determine future tariffs best balancing the need to recover costs and the customers' preferences for service taking into account the need to comply with national and international regulations.

Generic input to TOR section on "Scope of work"

Task {FILL-IN NUMBER}: Brief overview of the existing services

In order to provide information for the "with project" and the "without project" scenarios a technical and financial baseline shall be established. THIS MAY HAVE BEEN UNDERTAKEN ALREADY IN THE PRE-FEASIBILITY PHASE. IN THIS CASE IT SHOULD ONLY BE STUDIED AND REPORTED AS APPROPRIATE.

To prepare the technical and financial baseline the consultant should:

- Assess the current service level, conditions and operations;
- collect existing reports;
- collect data on the technical characteristics possibly using questionnaires and interviews; and
- one or more selected visit(s) to key facilities (to confirm conditions).

The state-of-affairs comprising the following infrastructure elements and operation characteristics must be studied and reported:

- The existing system for water extraction (groundwater or surface water intake), bulk water transport, water treatment, distribution network, wastewater collection, storm water collection, wastewater treatment and sludge disposal;
- the existing water and wastewater tariff structure; and
- existing subsidy schemes (if any).

Task {FILL-IN NUMBER}: Future service levels and costs

In order to provide information for an analysis of the demand for current and planned future services, the consultant should undertake the following.

Specify targets for the future service level by doing the following:

- Establish a "without project" scenario;
- establish one or more initial realistic "with project" scenario(s) specifying future service levels;
- discuss targets for future service levels with relevant people such as water utility officials, city officials etc; and
- outline technical options resulting from each scenario.

Assess costs of alternative future service levels by doing the following:

- Review existing studies for assessed costs of operating and maintaining the existing system; and/or
- review international cost experience for similar systems and assess country specific corrections necessary to transfer international experience;
- estimate O&M costs of the existing system;
- assess existing investment plans / proposals;
- guesstimate necessary investment costs to meet alternative service levels based on discussions with relevant persons such as water company officials, engineers, etc; and
- guessstimate financing terms based on discussions with key people in the water company, consultants, etc.

And finally, the Consultant shall preliminarily assess the full cost recovery tariff based on existing demand:

- Calculate rough tariffs resulting from the O&M costs, the investment costs (including financing) and assumptions about the institutional set-up.

Task {FILL-IN NUMBER}: Affordability

For households, the Consultant shall assess the following issues. The assessment will be based on an expenditure survey comprising at least 300 interviews - TO BE ADJUSTED TO SCOPE OF STUDY. The survey will be supplemented with available statistics, reports and data from the service provider. When analysing the data, the sample will be stratified, and it will be expanded by using available demographic statistics as appropriate.

The first task to address in the survey is to assess existing and future income and expenditure patterns:

- Assess current and future average household incomes and expenditure for water and wastewater services;
- assess the income distribution and - if possible - income specific expenditure for water and wastewater services; and
- assess the share of food expenditure in total household expenditure by income distribution deciles. This gives a good indication of the affluence of the population, which is not so sensitive to poor estimates of income and informal economy.

The existing tariff structure, metering etc are important determinants of household affordability. The Consultant shall:

- Describe existing tariff design and financial transfers;
- assess share of household consumption that is metered;
- describe existing tariff structure; and
- describe existing subsidy schemes (if any).

The Consultant will also identify whether future major utility price increases (for example for heat, power, rent) are expected.

For enterprises and public institutions, the Consultant shall look into matters being linked to affordability and payments related to households. This includes:

- Assess and quantify the cross-subsidisation between these consumers and household consumers;
- assess the likely future level of cross-subsidisation and explain any change anticipated;
- assess the alternatives to public water and wastewater provision available to these large-scale consumers. In this light assess how they will react to an increase in tariffs; and
- what the implications for the future revenues of the service provider are.

Task {FILL-IN NUMBER}: Customer perceptions and willingness to pay

In order to analyse customer perceptions and willingness to pay, the Consultant will carry out a Stated Preference based survey comprising at least 150 interviews - TO BE ADJUSTED TO SCOPE OF STUDY.

The interviews will cover a range of districts and types of households. When analysing the data, the sample will be stratified, and it will be expanded by using available demographic statistics as appropriate.

The Consultant shall undertake the following duties:

- Provide a qualitative description of following issues: history of price and service level, price and service level in nearby municipalities, public health, environmental amenity, trust in the water utility, and perception of fairness;
- determine the issues which are key to willingness to pay. The range of issues to consider shall at least include: Environmental issues, health issues, service delivery quality (regularity, water quality, service coverage);
- provide a quantitative assessment of willingness to pay for the key service level parameters using stated preference survey techniques; and
- provide suggestions for how to enhance willingness to pay, for example through information campaigns etc.

Task {FILL-IN NUMBER}: Demand analyses and price elasticity

THIS TASK IS ONLY RELEVANT WHEN CURRENT OR EXPECTED FUTURE PAYMENT IS RELATED TO ACTUAL METERED CONSUMPTION AND NOT EG FIXED BY NORMS.

The price sensitivity for the demand is important for understanding the possible changes in water consumption habits caused by tariff changes. The Consultant shall assess the price elasticity based on:

- Available historical data on water consumption, service level and tariffs;
- data collected during either the affordability survey or the willingness to pay survey on consumers historical pattern of usage and tariffs and the historical pattern of service level;
- data collected during the willingness to pay survey on consumers' stated reaction to tariff and service level changes.

The derived price elasticity will be used for assessing the impact of new tariffs and changed service level on consumption.

Task {FILL-IN NUMBER}: Political acceptability

In order to analyse the political acceptability of tariff increases and/or service level changes, the Consultant shall:

- Describe relevant background factors such as the degree of democracy in the policy process, the relative importance of water charges as a political issue, the level of organisation of consumers and other interest groups, the stability of the current political situation;
- assess institutional factors, such as the procedure for water tariff setting, the historical pattern of water tariffs, the ownership of the water service provider and how this may influence the ability to increase tariffs in the future;
- where relevant assess the public awareness of environmental and public health issues, international guidelines etc. and how these issues may affect political acceptability of increased water prices;
- assess the attitudes of political parties;
- assess the assumptions made by political parties in reaching these attitudes. Are the assumptions, which are the basis for the attitudes, well founded? Is this basis (and thus the assumptions) stable?

Task {FILL-IN NUMBER}: Assessment and recommendations related to tariff increases and service level changes

Based on a combination of the analyses of future service level and costs, and the customers willingness to pay, affordability and political acceptability, there shall be an iterative determination of future service level, required technical standard (and thus required investments and operational characteristics), appropriate tariff level and structure.

This shall lead to a conclusion on the key service level issues:

- Compare the quantitative assessment of willingness to pay (extra) for specific service improvements with the cost of providing this service. Take into account household and enterprise affordability as well as the assessment of political acceptability; and
- in the light hereof provide a simultaneous recommendation on a future service level and average tariffs and the phasing of service improvements and tariff increases over time.

5: Generic input to TOR section on "Time schedule, manning and outputs"

Time schedule and outputs

The timing of the public acceptability activities and the main outputs are summarised below:

- Working note on existing situation, 1 month after mobilisation;
- Working note on future service levels and costs, 1 month after mobilisation
- Working note on affordability, 3 months after mobilisation;
- Working note on political acceptability, 3 months after mobilisation;
- Working note on willingness to pay and price elasticity, 4.5 months after mobilisation; and
- Interim report (final report) on recommendations on service level and tariffs, 5.5 months after mobilisation.

Manning

For the purposes of the public acceptability analyses, the team will need to include:

- An economist with experience from the sector and with experience in affordability analyses;
- a consultant familiar with market research and stated preference techniques;
- a political scientist or legal specialist, preferably with experience from the region;
- local consultant (most likely an engineer, preferably one with a good overview of the sector); and
- local consultant(s) to organise and implement the market research.

Appendix 3:
Technical Profile Summary

Technical Profile Summary

Indicator	Sub-indicator	Unit	Figure
Land Use	Proportion of population living in housing blocks / flats	% of total population	
Overall Water Supply Coverage	Population served	Nos	
	Piped water supply population coverage	% of total population	
	Percentage of population served through house connections	% of population served	
	Percentage of population served through standposts (if any)	% of population served	
Overall Wastewater Coverage	Population served by wastewater collectors	Nos	
	Wastewater collection system population coverage	% of total population	
	Percentage of population served by septic tanks	% of total population	
	Percentage of population served by other sanitation systems (if any)	% of total population	
	Separate sewer system coverage (as opposed to the combined system)	% of population served by sewers	
Overall Wastewater Treatment Situation	Amount of wastewater not treated at all	% of total wastewater	
	Amount of wastewater receiving mechanical treatment only	% of total wastewater	
	Amount of wastewater receiving mechanical-biological treatment	% of total wastewater	
	Amount of wastewater receiving mechanical-chemical treatment	% of total wastewater	
	Amount of wastewater receiving mechanical-biological treatment with N and/or P removal	% of total wastewater	
Existing Water System Brief	Groundwater supply	% of total	
	Surface water supply	% of total	
	Water treatment plants	Nos	
	Water treatment plants, total capacity	m3/day	
	Water treatment plants, total production	m3/day	
	Transmission mains, length	km pipes	
	Pumping stations	Nos	
	Storage Reservoirs	Nos	
	Storage Reservoirs, total volume	m3	
	Distribution system, total	km pipes	
	Hereof Distribution system, <= 250 mm	%	
	Hereof Distribution system, > 250 mm	%	
	Service Pipes (connections)	km pipes	
	Age of pipes; % of pipes more than 30 years old	% of pipes	
	Age of pipes; % of pipes more than 50 years old	% of pipes	
Existing Wastewater System Brief	Wastewater collectors including connections, total	km sewers	
	Wastewater collectors, < 450 mm	%	
	Wastewater collectors, >= 450 mm	%	
	Age of sewers; % of sewers more than 10 years old	% of sewers	
	Age of sewers; % of sewers more than 55 years old	% of sewers	
	Pumping stations	Nos	
	Wastewater treatment plants	Nos	
	Wastewater treatment plants, total capacity	m3/day	
	Wastewater treatment plants, total load	m3/day	
	Final disposal of sludge		
Unit Consumption - Water Balance	Total water production	m3/day	
	Total water consumption	m3/day	
	Domestic water consumption	m3/day	
	Gross unit water consumption per capita	l/cd	
	Domestic unit water consumption per capita	l/cd	
	Unaccounted-for-water (total production-total consumption divided by total production	l/cd	
	Unaccounted-for-water in percent of production	% of production	
	Unaccounted-for-water per km pipe	m3/km pipe/day	
Consumer Groups and Metering	Total connections, water supply	Nos	
	Hereof Domestic connections	Nos	
	Hereof Industrial connections	Nos	
	Hereof Institutional connections	Nos	
	Domestic metering coverage	% of domestic connections	
	Industrial metering coverage	% of industrial connections	
	Institutional metering coverage	% of institutional connections	
	Total connections, wastewater collection and treatment	Nos	
Operations, Water	Number of days of production	Nos days per month	
	Number of hours of production	Nos hours per day	
	Population with 24 hours supply	% of population served	
	Population with 18-24 hours supply	% of population served	
	Population with 12-18 hours supply	% of population served	
	Population with 6-12 hours supply	% of population served	
	Population with < 6 hours supply	% of population served	
	Breakdowns on distribution system	Nos breakdowns/yr	
	Breakdown intensity	Nos breakdowns/100 km pipes/yr	
	Consumer complaint frequency	Nos complaints/100 connections/yr	
	Yearly water pipe rehabilitation	km water pipes repaired per year	
	Water pipe rehabilitation intensity (km pipes repaired per year as % of total network)	% of total length of network	
	Chemical water quality not fulfilling the standards	% failures of water samples	
	Key parameter(s) not fulfilling the standards		
	Bacteriological water quality not fulfilling the standards	% failures of water samples	
Operations, Wastewater	Blockages	Nos blockages/yr	
	Blockages intensity	Nos blockages/100 km sewer/yr	
	Yearly sewer rehabilitation	km of sewers repaired per year	
	Sewer rehabilitation intensity (km sewers repaired per year as % of total network)	% of total length of network	
	CCTV inspection of sewers	km of sewers inspected totally	
	CCTV inspection degree	% of sewers inspected	
	Effluent standard, BOD, standard	mg BOD/l	
	Effluent standard, SS, standard	mg SS/l	
	Effluent standard, NH3, standard	mg NH3/l	
	Effluent standard, Tot-N, standard	mg Tot-N/l	
	Effluent standard, Tot-P, standard	mg Tot-P/l	
	Effluent quality not fulfilling the standards	% failures of effluent samples	
	Key parameter(s) not fulfilling the standards		
Efficiency	Number of staff	Nos	
	Staff Efficiency I	1000 persons served per staff member	
	Staff Efficiency II	1000 m3 water sold per year per staff member	
	Staff Efficiency III	km water and wastewater pipes per staff member	

Comments to technical profile summary - System Data

Re.: Land Use
We have included an indicator for the proportion of population living in housing blocks. In most of the CIS, apartments in housing blocks do not have individual meters. Thus, the indicator provides an indication of the expected level of individual household metering.

Re.: Overall Water Supply Coverage
The indicators under this heading provide a general description of the water supply coverage. These indicators are typically available from the water utility.

Re.: Overall Wastewater Coverage
The indicators under this heading provide a general description of the wastewater collection system coverage. These indicators are typically available from the water utility.

Re.: Overall Wastewater Treatment Situation
The indicators under this heading focus on current type of wastewater treatment (mechanical, biological treatment, nutrient removal). These indicators are typically available from the water utility. It is important to distinguish between design capacities and technologies.

Re.: Existing Water System Brief
Under this heading, the existing water supply facilities are summarised.

A technical description requires an assessment of the condition of the infrastructure. This is complicated by the fact that the vast majority of the investments is underground. Some rough estimate of the quality of the "hidden" infrastructure is essential to be able to provide a reasonable forecast of how service levels for water supply / wastewater collection will develop in the future in the "without-project" scenario and also to assess the anticipated rehabilitation level requirements. Typically, the age / material profile of the water and wastewater networks - combined with local experience in maintenance requirements - are used as indicator of the condition of the networks.

The water network typically constitutes say 75% of the water supply assets, and as these facilities are underground, we need a proxy for the condition of the systems (and thereby needs for investments). We have suggested the pipe age distribution, as such an indicator is often roughly known.

Re.: Existing Wastewater System Brief
Under this heading, the existing wastewater facilities are summarised. As for the water network, we have also for the wastewater collection network included indicators covering the age profile of the network.

Re.: Unit Consumption - Water Balance
Under this heading some important indicators are provided.

Together with the UfW (Unaccounted-for-Water) estimate, the gross and domestic per capita unit water consumption will ideally provide information on consumption levels, network condition and potentials for reduction in production/consumption. For the UfW we have included two indicators - % of production, and m3/km pipe/day. The first indicator is most frequently quoted, but can be misleading - not the least in systems with high unit water consumption. The m3/km pipe/day is a much better indicator for assessing the condition of the pipe network.

Generally, the water consumption is only partly metered, or is at maximum metered through group meters. The key metering problem is at the large housing blocks / flats, where the original technical design of the buildings complicates installation of individual household water meters.

Therefore, in many cases the consumption/production data are based on norms, or pump characteristics combined with data on pump operation hours. This reliability problem makes it essentially important that sound judgement and "guesstimates" of the water balance are made early in project preparation process.

Re.: Consumer Groups and Metering
Under this heading, the number of connections and metering coverage is provided. Often there is a confusion about the number of connections / accounts, again due to the large housing blocks, which sometimes are recorded as one connection (through a group meter) and other times recorded as many connections reflecting the number of flats in the block. Therefore, the metering coverage figures should be assessed carefully.

Comments to operational service data
There is not always correlation between the technical reality and people's perception of the reality. Take the water quality as an example. That the water quality fulfils applicable standards is not necessarily a guarantee that people are satisfied with the quality - and visa versa. Consumers typical give highest priority to bacteriological water quality (not measured in E-coli, but rather measured in not getting sick) and the more aesthetical water quality parameters.

In an analyses which also focuses on service levels and on water utility revenues as a result of willingness to pay etc., it is essential to take the customer perspective. This is done through the questionnaires and assessments of customer perception. Here we provide the technical background against which to assess customer perceptions.

Text Box: Discrepancy between Actual and Perceived Water Quality

- In the **City of Brno** a part of the water network (say 20-30%) being supplied by surface water had had severe water quality problems up to about 4 years ago, where major rehabilitation of the water treatment plant was made. Today, only less than 5% of the water supplied in Brno is surface water. Now, the water quality - according to the controlling body (City Hygienic Station) - is very good, with a low failure rate. However, it still is very common that people complain about the water quality (and buy bottled water for drinking). For a few of the consumers (the ones who live in the "bordering zone" between groundwater and surface water supply) the complaints might be related to frequent changes in water quality depending on whether water is supplied from groundwater or surface water sources.
- In the **City of Poznan** the technical water quality is likewise reported to fulfil the standards with a low failure rate. Still people install household filters to improve the water quality.
- In 1997, the water quality in Baku, Azerbaijan was very poor, with 30% of the water samples not fulfilling the bacteriological quality criteria and 84% not fulfilling the turbidity criteria. People had for years boiled their drinking water, and therefore the peoples' largest complaint was not the poor bacteriological quality but instead the high turbidity.

Re.: Operational service indicators - Water

Under this heading, the key operational indicators of reliability of water services is described through a number of indicators:

- Average number of days of production per month and average number of hours of production per day;
- Reliability is a highly important but difficult issue to address, because the situation might differ in various parts of the supply area. Furthermore, there are no physical data measuring reliability, the closest approximation being the average production hours per day, which in some areas might be far from the actual supply. The most common way of assessing reliability is through household surveys. The indicator of reliability of supply has to be matched with a percentage of population having that level of reliability.

Reliability of supply measured as proportion of consumers receiving water for 6, 12, 18 and 24 hours per day:

- Breakdown intensity calculated as the number of reported breakdowns per 100km pipes/yr.

This indicator will together with the UfW and age profile contribute to the assessments of the present condition of the water network:

- Consumer complaint frequency, calculated as the number of complaints per 100 connections per year;
- Water pipe rehabilitation intensity, calculated as percentage of water network (km pipes) rehabilitated per year.

This indicator describes the current rehabilitation level and provides information on potential backlog of rehabilitation. If pipeline lifetime on average is say 50 years; one should on average rehabilitate 2% per year:

- Water quality failure rate, calculated as % of chemical water quality tests / bacteriological water quality tests not fulfilling the standards.

Re.: Operational Indicators - Wastewater

Under this heading, the key operational indicators of reliability of wastewater services is described through a number of indicators:

- Blockage intensity, calculated as the number of blockages per 100 km sewers/year.

This indicator will - together with the age profile - contribute to the assessments of the present condition of the water network:

- Sewer rehabilitation intensity, calculated as a percentage of wastewater collection network (km sewers) rehabilitated per year.

This indicator describes the current rehabilitation level and provides information on potential backlog of rehabilitation. If pipeline lifetime on average is say 50 years; one should on average rehabilitate 2% per year:

- CCTV inspection degree, calculated as the % of sewer network inspected by CCTV.

This indicator will - together with the blockage intensity and the age profile - contribute to the assessments of the condition of the water network. The indicator further can be used as a proxy for reliability of the condition assessments (the higher percentage of sewers CCTV inspected, the higher reliability in the condition assessments):

- Key Effluent Standards (BOD, SS, NH3, Tot-N and Tot-P)
  Effluent Standard Failure Rate, calculated as % of effluent quality tests not fulfilling the standards. This indicator will contribute to the assessment of the wastewater treatment efficiency.

Efficiency Indicators

A few indicators on staff efficiency have been included for overall assessments of the current staffing levels:

- Staff Efficiency I: Number of persons served per staff member;
- Staff Efficiency II: Number of m3 water sold per year per staff member; and
- Staff Efficiency III: Km of water and wastewater pipes per staff member.

Many of the numbers can be compared to international standards by using benchmarking studies or searching the Web. Two good sources are the EBRD (2000) indicator study for Poland prepared by WRC and the World Bank sponsored web-site.

http://www.worldbank.org/html/fpd/water/topics/uom_bench.html

Appendix 4: Generic Topic Guide

This topic guide provides a list of questions, which can be used in a topic guide for depth interviews or group discussions. The exact content of the topic guide will depend on the local circumstances as elicited from reference to the Terms of Reference, background research and discussions with relevant people.

Introduction
This research is being undertaken on behalf of ____ *[name of company]*.

We are interested in your experiences and attitudes towards the water and wastewater services you receive from _____ *[water company]*.

This research is being undertaken for ____ *[client]*. The ___ City authority and the _____ *[water company]* are aware of this research but the research is independent of them. Therefore, all your answers will be confidential.

Respondent characteristics
Where do you live? **Refer to map**

Sex

Age

Type of accommodation. If flat: Which floor?

Probe Number of persons in household/household composition/employment status

Person #	Pensioner	Adult	Child	Employed?

(preferably at end of interview)[25] What is the average (monthly) income for your household?
(preferably at end of interview) Do you think your household will be financially better off next year?

Cold Water Supply
How is your consumption measured?

Do you have a block meter or household meter?
IF YES: Why did you get a meter?
IF NO: Have you considered installing a meter?

Do you get hot water centrally supplied or do you heat your own?

25 This and the following question may make respondents uncomfortable. It is therefore preferable to ask these questions towards the end of the interview / discussions.

Assessment of present cold water service

What is your opinion of the present level of cold water quality/services?

Do you get cold water 24 hours a day?

IF NO: probe when do you not get water? Is this scheduled?

Do you (also) get other interruptions in water supply? Probe whether planned or unplanned

What is the cold water pressure like? Does it vary?

What is the colour of the water like? Does it vary?

Do members of your household drink cold water directly from the tap?

IF YES: What is the taste like? Does the quality vary? Do you always drink it?

IF NO: why not?

Do you buy bottled water?

IF YES: How much (in typical summer month/winter month)? Why?
(**Probe if health, taste, status, adverts etc**), Cost?

IF NO: Why not?

Do you have a water filter? Why? IF NO: Have you considered getting a water filter? Why?
Have you noticed any change in the quality of your water or level of service (including bills) in the last few years?

Assessment of present wastewater service

What is your opinion of the present level of **wastewater** treatment? **Probe**

Have you noticed any change in the **wastewater** services in the last few years?

Do you know who manages the **wastewater** services?

Are you aware of any problems with the present wastewater treatment?
(**Probe local environment, rivers and lakes etc**)

Political Issues

Did you vote at the last election? (if no, why not)

What do you think of the current mayor?

Is the city council responsive to the needs of the citizens of ____ *[city]*?

How much influence do you think the city council has on the water company?

In your opinion, how much influence does political opinion have on the water tariffs?
Why do you say that?

How do you think water services and investments in water services are currently financed?
Probe – taxes, bills, other

(If relevant) Currently water is paid for through a mix of taxes and customers bills. What do you think of the idea of all water costs, including investments in the infrastructure, being paid for through bills instead of taxes?

(If relevant) What is your attitude to EU membership?

Does your household regularly recycle anything? **Probe**

Attitudes to Water Company
What is your opinion on the overall effectiveness of ___ [the water company] in managing the water supply and **wastewater** treatment?

Does ___ *[the water company]* keep you well informed about their operations?

Where do you get information about water services?

Have you had to call ___ *[the water company]* for any problem or query with regard to the supply of water or **wastewater** in the last few years? **Probe quality of service/any problems**

Payment of water bills
Are you responsible for paying the water services bill?

Where and how do you pay your bill? Frequency of bills?

When did you last pay your water bill?

How are the cold water bills calculated?

Are the water bills easy to understand? What is included in the bill?
Probe, cold water, wastewater, hot water etc

(If relevant) Do you know how much is the total cost of water per cubic metre?

(If relevant) Do you know how much is for cold water supply and wastewater?

Do you get a subsidy for your bills?

IF YES: Probe details
IF NO: Do you know when and how you can get a subsidy?

What happens if you do not pay? Should non-payers be cut-off?

How much water does your household consume a year? Has this gone up or reduced in the last few years? Why?

Could you reduce your water consumption and **wastewater** generation (leaks, watering the garden, habits in kitchen and bath-room etc)

Willingness to pay

What do you think about the amount you have to pay for water and **wastewater**?

What about payment for electricity, rent, garbage collection, lifts, gas/oil/heating, hot water?

Do you think the price of water and **wastewater** services have increased more or less than other prices in the last three years?

If water prices were to increase, do you think electricity, gas, rent and heating would also increase by a similar rate? Why do you say that?

What are the most important improvements that could be made to the water service? **Probe**

How much more would you be willing to pay for this?

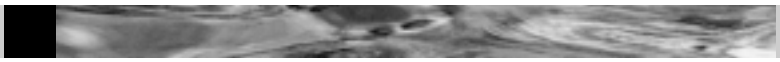
(If no improvement is foreseen) How much more would you be willing to pay to avoid the current service getting worse, for instance interruptions to supply, even lower water quality?

If the cost of electricity, gas and heating increased by 20%, how much would you then be willing to pay for improvements to your water services?

Would you prefer to pay less and have worse water quality?

If prices are increased 50%/100%/200%, what would you do?

Appendix 5:
Generic Quantitative Questionnaire



This questionnaire provides a list of questions which can be used in the stated preference questionnaire. The exact content of the questionnaire and the format of the stated preference game will depend on the findings of the qualitative research and the design work.

Water and Wastewater in _____

Interviewer name: **Date:**

Time:

Introduction

Good morning/afternoon/evening. My name is ..... and I am carrying out research on behalf of ___ [consultant]. We are interested in your experiences and attitudes towards the water and wastewater services you receive from your water company.

This research is being undertaken for ___ [client]. The ____ City authority and the water company are aware of this research but the research is independent of them. Therefore, all your answers will be confidential.

Background Information

Q1. First, I would like to ask you some questions about your accommodation and your household. How many years have you lived here?

.....

Q2. How many adults (aged 18 *[age as appropriate]* years and over) live in this household including yourself?

.....

Q3. How many children (aged 6-17 *[age range as appropriate]* years) live in this household?

.....

Q4. How many infants (aged under 6 *[age as appropriate]* years) live in this household?

.....

Q5. What is the employment status of the chief earner of the household? **PROBE** *[with categories as appropriate]*

1.	Employed by public sector	5.	Student	1	5
2.	Employed by private sector	6.	Retired	2	6
3.	Self employed	7.	Other	3	7
4.	Not working			4	

Optional question to determine relative importance of water with respect to other core services

Q6. How important is it to you that improvements are made to each of the following services?

	Not important at all	Not important	Neither	Important	Very important
Disposal of refuse	1	2	3	4	5
Local roads	1	2	3	4	5
Protection of the local environment	1	2	3	4	5
Police and prisons	1	2	3	4	5
Public transport	1	2	3	4	5
Supply of household cold water	1	2	3	4	5
Treatment of wastewater	1	2	3	4	5
Education	1	2	3	4	5
Health	1	2	3	4	5
Housing	1	2	3	4	5

Cold Water Services

Q7. Do you have a separate cold water meter for your household?

1	Yes	3	No	1	3
2	No, water meter is for block of flats	4	Don't know	2	4

Q8. Do you pay based on consumption measured on your cold water meter?

1	Yes	3	Don't know	1	3
2	No			2	

Q9. Are you billed directly by the water company?

1	Yes	2	No	1	2

Next two questions if water supply is not always 24 hours

Q10. Do you usually receive cold water to your home 24 hours a day?

1	Yes GO TO Q12.	2	No	1	2

Q11. Between what hours do you usually **not** receive cold water?

From ..... To:.....

Q12. Do you heat your water?

1.	Yes	2.	No	1	2

Q13. Do you know which organisation is responsible for your cold water and wastewater?

1.	Yes, ____ *[water company]*	3.	No	1	3
2.	Yes, other			2	

IF NOT ____ *[water company]*, INFORM RESPONDENT THAT ____ *[water company]*RUN WATER SERVICES

Q14. Which of the following do you think should be responsible for providing ____ *[city's]* cold water services? **READ OUT**

1.	The municipal authority	1
2.	A private company that is _____ *[country name]* owned	2
3.	A private company that is foreign owned	3
4.	A combination of the above	4
5.	Don't know	5

Q15. How do you rate the quality of your cold tap water?

2	Very poor	4.	Good	1	4
3	Poor	5.	Very good	2	5
4	Neither good nor poor	6.	Don't know	3	6

Q16. How would you rate the quality of the following aspects of your cold water supply on a scale of 1 = very poor to 5 = very good.
SHOWCARD A *[individual characteristics to be determined in qualitative research]*

	Very poor	Poor	Neither	Good	Very good	don't know/not applicable
Sediment in the tap water	1	2	3	4	5	9
Smell	1	2	3	4	5	9
Colour	1	2	3	4	5	9
Taste	1	2	3	4	5	9
Water pressure	1	2	3	4	5	9
Healthiness of water (potability)	1	2	3	4	5	9
Interruptions	1	2	3	4	5	9
Information provision about your water	1	2	3	4	5	9
Value for money (price)	1	2	3	4	5	9

Q17. Do you drink the cold water straight from the tap? **PROBE**

1	No, never	4	Yes, often **GO TO** Q19.	1	4
2	Yes, rarely	5	Yes, always **GO TO** Q19.	2	5
3	Yes, sometimes			3	

Q18. Why don't you drink the cold water (more often)?

.....

.....

Q19. Have you noticed any change in the quality of your cold water in the last few years?

1	Cold water improved	3	No change	1	3
2	Cold water worsened	4	Don't know	2	4

Wastewater

Q20. How would you rate the current standard of wastewater treatment in ____ *[city]*?

1.	Very poor	4.	Good	1	4
2.	Poor	5.	Very good	2	5
3.	Neither good nor poor	6.	Don't know	3	6

Q21. Are you aware of any change in the quality of wastewater treatment in the last few years?

1	Wastewater improved	3	No change	1	3
2	Wastewater worsened	4	Don't know	2	4

Q22. Do you think the current standard of wastewater treatment in ____ *[city]* causes any problems to the local environment?

1	Yes	3	Don't know **GO TO** Q24.	1	3
2	No **GO TO** Q24.			2	

Q23. What problems does it cause? **CIRCLE '1' FOR ALL MENTIONED, DO NOT READ OUT** *[categories as derived from qualitative research, for instance]*

Bad smell of rivers 1
Bad quality water for people down stream 1
Inability to fish/eat fish from rivers 1
Inability to swim in rivers/reservoirs 1
Algae in water 1
Other 1

The Need for Investment

Q24. If ____ *[city]* had to choose between the three following options which do you think they should choose?

1.	Reduce charges and reduce quality of water and wastewater services	1
2.	Keep charges and spending on water and wastewater services at the same level as now	2
3.	Increase charges and spend more on the provision of water and wastewater services **GO TO** Q26.	3
4.	Don't know **GO TO** Q26.	4

Q25. Why do you think that charges for cold water and wastewater treatment should not be increased? **CIRCLE '1' FOR ALL MENTIONED, DO NOT READ OUT**

I cannot afford to pay any more 1
Further investment in cold water and wastewater treatment is not necessary 1
Other cities or regions have lower charges than ____ *[city]* 1
As a general principle water charges should not be increased 1
It will result in social hardship for the poorest sections of society 1
Increase charges will simply add to profits for water company 1
Water charges are too high now 1
Increasing charges will cause a decrease in consumption 1
Water costs should not increase unless water quality is improved 1
Other (please write in) 1

Q26. Which of the following do you think is the most important reason for improving wastewater treatment? **READ OUT** *[categories as derived from qualitative research, for instance]*

1.	To improve public health	1
2.	To protect the environment	2
3.	To allow the country to meet EU entry requirements	3
4.	Don't know	4

Q27. Do you think the water company cares more for their customers or their profits?

1.	Their customers	3.	The same	1	3
2.	Their profits	4.	Don't know	2	4

Q28. Where do you get information about the water company or your water and wastewater services from? **CIRCLE '1' FOR ALL MENTIONED DO,NOT READ OUT** *[categories as derived from qualitative research for instance]*

I get no information 1
Local newspaper(s) 1
National newspaper(s) 1
Radio 1
Television 1
By phoning water company 1
water company offices 1
water company pamphlet.....1
Council 1
By post from water company.....1
Family/friends/colleagues.....1
From the bill.....1
From co-operative/landlord 1
From my job.....1
Other (please write in) 1

Bills

Q29. How much do you pay for your cold water and wastewater? **PROBE FREQUENCY AND WRITE IN**

Per month:..... Per year:.....

IF DON'T KNOW ASK RESPONDENT TO REFER TO BILL OR PROVIDE ESTIMATE

INTERVIEWER RECORD IF ESTIMATE OR FROM BILL

1	Estimate	2	Bill	1	2

Q30. Is the cold water and wastewater bill included with other items or separate?

1.	With other item(s)	2.	Separate	1	2

An alternative format for those with integrated bills. The components to be defined through the qualitative research

Q31. What are the charges in your last bill for each of the services in the table below? COMPLETE TABLE BELOW USING HOUSEHOLD SERVICES BILL. ALSO ASK FOR ELECTRICTY BILL AND GAS BILL IF NOT INCLUDED IN HOUSEHOLD SERVICES BILL

Service	**Amount paid for total household per month**
Rent (service charge)	
Heating	
Cold water (and sewage)	
Hot Water	
Gas	
Radio	
TV Aerial	
Lighting for common parts	
Waste collection	
Lift	

Electricity	
Gas	
Sewage	
Telephone	
Other (Please specify)	

Q32. What proportion of your water bill is for wastewater? **IN %**

.....

999 Don't know 999

Q33. Do any members of your household receive privileges which reduces the amount you pay for ____ *[water/some of the above services]*?

1 Yes 2 No 1 2

Q34. Does your household receive a subsidy? *[if appropriate]*

1 Yes 2 No 1 2

Q35. When did you last pay your _____*[water/household services]* bill?

Month:.....

Q36. Which month was that bill for?

Month:.....

Q37. What is the cold water consumption in your household per ___ *[time period as appropriate]*?

Per _____: .....cubic meters

9 Don't know 9

INTERVIEWER: If the respondent doesn't know the cold water consumption, inform respondent that cold water costs ___ per cubic meter and therefore the amount of water they use is ……..(cost in Q29/cubic meter charge) per month/year.

Q38. Should non-payers of water charges be disconnected from the water system?

1. Yes 3. Don't know 1 3
2. No 2

Q39. Are the following services worth the money you pay for them on a scale from 1 = definitely not and 5 = definitely are? **READ OUT; SHOWCARD C**

	No, definitely not	no, not	neither	yes, are	Yes, def. are	not applicable
Electricity	1	2	3	4	5	9
Gas	1	2	3	4	5	9
Food	1	2	3	4	5	9
Public transport	1	2	3	4	5	9
Housing costs	1	2	3	4	5	9
Cold water and wastewater	1	2	3	4	5	9
Hot water	1	2	3	4	5	9

Q40. Has your household changed its consumption of cold water in last two years?

1. Yes, reduced 3. Don't know **GO TO** Q42. 1 3
2. Yes, increased 2

Q41. Why has your household changed water usage? CIRCLE '1' FOR ALL MENTIONED, DO NOT READ OUT

To save money 1
For environmental reasons 1
Change number of people in household 1
Other (please write in) 1

Q42. Could your household reduce its cold water usage (any further)?

1.	Yes	2.	No **GO TO** Q44.	1	2

Q43. How would you reduce your household cold water usage?

.....

.....

Q44. How much has the cost per cubic metre for cold water and wastewater treatment gone up in the last two years? **IN %**

.....

Questions on water from other sources and water filters as appropriate

Q45. Does your household buy bottled water?

1	Yes	2	No **GO TO** Q33.	1	2

Q46. How many litres of water does your household buy a week on average?

.....

Q47. Does your household have a water filter?

1	Yes, in the pipe in the house	3	No	1	3
2	Yes, a separate small container	4	Don't know	2	4

Q48. Does your household use water from a well?

1	Yes	2	No **GO TO** Q52.	1	2

Q49. How far away from your home is the well?

1	Well is at my home	4	5-10 km	1	4
2	less than 2 km	5	10-20 km	2	5
3	2-5 km	6	more than 20 km	3	6

Q50. How often does a member of your household go to the well per month?

Winter:.....times per month Summer:.....times per month

Q51. Around how many litres of well water do you use per month in summer and winter?

Winter:.....litres per month Summer:.....litres per month

Q52. How much does your household spend on the following items per month?

Item	Winter (per month)	Summer (per month)
Water Filter		
Bottled Water		
Transportation costs to well		

Willingness to pay

I am now going to ask you to choose between different options for your cold water supply and wastewater treatment. These options will include different levels for: *[three or four variables, each with two to four levels as derived from qualitative research and design stage, for instance]*

Example variables and levels:

- The quality of cold water from the tap:
  - either as it is now or
  - cold water is always safe to drink directly from the tap
- Supply and pressure of your cold water
  - either as now or
  - cold water supplied 24 hours a day and pressure as it is now
  - cold water supplied 24 hours a day and always good water pressure
- The quality of the cold water supplied to your household:
  - either as it is now or
  - drinkable but with a chlorine taste or
  - as good as bottled water
- The quality of the wastewater treatment:
  - either as now or
  - the wastewater treatment means that the surrounding rivers and reservoirs are clean enough for a wide variety of fish and to be able to swim safely
- Unplanned interruptions to the cold water supplied to your household during the day time for 1-2 hours:
  - either as it is now or
  - no interruptions at all
  - once a month
- The smell of the cold water from the tap:
  - either as now or
  - no smell at all
  - smells of chlorine even after boiling
- The colour of the cold water:
  - either as now or
  - always completely clear
  - slightly coloured (with traces of rust)
- The cost you pay for cold water services per ___ *[appropriate period]*
  - either current, that is ….
  - current plus x, that is …..
  - current plus y, that is …..
  - current plus z, that is …..

For each pair of options I would like to say which you would prefer. You may not like either, but please choose one.

When making your choices please assume that all other aspects of cold water and wastewater not mentioned are the same as now.

Example option pairs:

A	or	**B**	A B
• WATER QUALITY: always safe to drink directly from the tap • SMELL: as now • SUPPLY AND PRESSURE: water supply and pressure as now • COST: 10%		• WATER QUALITY: always safe to drink directly from the tap • SMELL: no smell at all • SUPPLY AND PRESSURE: water supplied 24 hours a day and always good pressure • COST: PLUS 25%	

A	or	**B**	A B
• WATER QUALITY: always safe to drink directly from the tap • SMELL: as now • SUPPLY AND PRESSURE: water supplied 24 hours a day and pressure as now • COST: PLUS 10%		• WATER QUALITY: as now • SMELL: as now • SUPPLY AND PRESSURE: water supplied 24 hours a day and pressure as now • COST: as now	

A	or	B	A	B
• WATER QUALITY: always safe to drink directly from the tap • SMELL: no smell at all • SUPPLY AND PRESSURE: water supply and pressure as now • COST: PLUS 25%		• WATER QUALITY: as now • SMELL: no smell at all • SUPPLY AND PRESSURE: water supply and pressure as now • COST: PLUS 10%		

A	or	B	A	B
• WATER QUALITY: always safe to drink directly from the tap • SMELL: as now • SUPPLY AND PRESSURE: water supply and pressure as now • COST: PLUS 10%		• WATER QUALITY: as now • SMELL: as now • SUPPLY AND PRESSURE: water supplied 24 hours a day and always good pressure • COST: as now		

A	or	B	A	B
• WATER QUALITY: as now • SMELL: no smell at all • SUPPLY AND PRESSURE: water supplied 24 hours a day and always good pressure • COST: PLUS 10%		• WATER QUALITY: always safe to drink directly from the tap • SMELL: as now • SUPPLY AND PRESSURE: water supplied 24 hours a day and pressure as now • COST: PLUS 10%		

A	or	B	A	B
• WATER QUALITY: as now • SMELL: as now • SUPPLY AND PRESSURE: water supplied 24 hours a day and pressure as now • COST: PLUS 10%		• WATER QUALITY: as now • SMELL: as now • SUPPLY AND PRESSURE: water supplied 24 hours a day and always good pressure • COST: PLUS 25%		

A	or	B	A	B
• WATER QUALITY: always safe to drink directly from the tap • SMELL: as now • SUPPLY AND PRESSURE: water supply and pressure as now • COST: PLUS 25%		• WATER QUALITY: as now • SMELL: no smell at all • SUPPLY AND PRESSURE: water supply and pressure as now • COST: PLUS 25%		

A	or	B	A	B
• WATER QUALITY: always safe to drink directly from the tap • SMELL: no smell at all • SUPPLY AND PRESSURE: water supplied 24 hours a day and always good pressure • COST: PLUS 40%		• WATER QUALITY: as now • SMELL: as now • SUPPLY AND PRESSURE: water supply and pressure as now • COST: PLUS 10%		

Q53. If cold water and wastewater costs were ___ *[current + x]* per cubic metre, do you think your household would reduce the amount of cold water it uses?

1. Yes 2. No **GO TO** Q55. 1 2

Q54. By what proportion would your household reduce its cold water consumption? **IN % OF VOLUME**

.....

Q55. If cold water and wastewater costs were ___ *[current + y]* per cubic metre, do you think your household would reduce the amount of cold water it uses?

1. Yes 2. No **GO TO** Q57. 1 2

Q56. By what proportion would your household reduce its cold water consumption? **IN % OF VOLUME**

Q57. Do you think there will be a similar increase in gas or electricity prices if water prices go up?

1. Yes 2. No 1 2

Q58. I would now like to ask you how important it would be to you for the following improvements to be made to the cold water services you receive using the following scale: **SHOWCARD D, READ OUT** *[improvements determined by qualitative research]*

	very un-important	un-important	neither	important	very important
No sediment in the tap water	1	2	3	4	5
The cold tap water has no smell at all	1	2	3	4	5
Always completely clear water from the cold water tap	1	2	3	4	5
Cold tap water tastes the same as still bottled water	1	2	3	4	5
No interruptions at all to the cold water supplied to your household	1	2	3	4	5
Re-supply of cold water after interruption within two hours	1	2	3	4	5
Consistently high cold water pressure	1	2	3	4	5
Cold water safe for children to drink straight from the tap	1	2	3	4	5
The water company provides an information leaflet on cold water services once a year eg water quality test results and information on water and wastewater investments	1	2	3	4	5
Free 24 hour telephone number for water services information	1	2	3	4	5
The quality of wastewater treatment means that the surrounding rivers and reservoirs are clean enough for a wide variety of fish and to be able to swim safe	1	2	3	4	5
The level of wastewater treatment meets EU standards	1	2	3	4	5
The water company provides advice about water saving methods to your household in a leaflet	1	2	3	4	5
The cost of cold water stays the same as now	1	2	3	4	5

Q59. Did you vote in the most recent municipal elections in ___*[year]*?

1. Yes 3. Not eligible **GO TO** Q61. 1 3
2. No **GO TO** Q61. 2

Q60. Which party did you vote for? [categories as derived from qualitative research, for instance]

____ 5. _____	1	5
____ 6. Other (please write in) ……	2	6
____ 7. Not prepared to say	3	7
____	4	

Q61. Does your household regularly recycle anything? **CIRCLE '1' FOR ALL MENTIONED** *[categories as derived from qualitative research, for instance]*

No	1
Yes, paper	1
Yes, glass	1
Yes, plastics	1
Yes, aluminium	1
Yes, cloth/fabric	1
Yes, organic waste	1
Yes, other	1

Q62. Do you in general agree with any of the following environmental organisations? **CIRCLE '1' FOR ALL MENTIONED, READ OUT**
[categories as derived from qualitative research, for instance]

____1
____1
____1
____1
Other (please write in)…… 1
Don't know.....1
No 1

Q63. What type of accommodation do you live in? [categories as derived from qualitative research, for instance]

1. rented flat 1
2. privately owned flat 2
3. rented house 3
4. privately owned house 4

Q64. In which of the following bands is your monthly household income after tax? **READ OUT OR SHOW RESPONDENT**
[categories as derived from qualitative, research for instance]

1.	____ per month	5.	____ -____ per month	1	5
2.	____ -____ per month	6.	____ -____ per month	2	6
3.	____ -____ per month	7.	____ -____ per month	3	7
4.	____ -____ per month	8.	over ____ per month	4	8

Alternative income question

Q65. What is average amount of incoming money, per month, for each member of your household, after income tax?
Please include money received from all sources **COMPLETE THE TABLE BELOW**

Person in household	Incoming money per month with tax removed
#1	
#2	
#3	
#4	
#5	
Any other sources #1. Please write in:	
Any other sources #2. Please write in:	

Q66. How much has your household income increased in the last two years? **IN %**

.....

Q67. How old are you? [with appropriate age ranges, for instance]

1.	18-24	4.	45-54	1	4
2.	25-34	5.	55-60	2	5
3.	35-44	6.	61 or older	3	6

Q68. INTERVIEWER: CODE GENDER

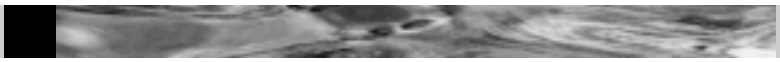
1.	Male	2.	Female	1	2

Thank you for your help in this research

I confirm that this interview is completely confidential

Interviewer's signature:

Appendix 6:
Generic Briefing Notes



Introduction

This survey is being undertaken by ____ *[consultant]* for ___*.[client]*

This research is part of a project ____ *[describe project aims]*

The first part of the research was ___ *[describe qualitative phase]* to examine their attitudes towards water services in ___ *[city]* as well as willingness to pay for improvements.

The next stage was a pilot. A few changes were made to the questionnaire as a result of these pilot interviews. We are now about to commence the main phase of # interviews with ___*[city]* residents.

Recruitment

It is important that the sample of residents represents the population of ___*[city]*.
____*[Insert description of random sampling methodology]*.

The recruitment questionnaire will explore who is responsible for paying the cold water and wastewater bill. This is the person we want to interview. If they refuse ___ *[describe replacement method]*. If it is not convenient for the person to be interviewed then, or the person responsible for paying the water bill is not there, arrange a date and time for the interview.

If there is no one there call back up to three times at different times and days.

Main Questionnaire

Attach the recruitment questionnaire to the main questionnaire for the same respondent. It is important that these are kept together.

Read the introductions and all questions exactly as written. If the respondent starts talking about other things or gives very long and complicated answers politely but firmly repeat the questions and ask for a precise answer.

Interviewer instructions are in **UPPER CASE BOLD.** These instructions should not be read out to respondents.

The answer to some questions have instructions for jumping to another question, for instance, **GO TO Q10.**

To fill in the answers to the questions, circle the numbers in the right hand margin or write on the dotted lines. All questions should be asked, unless there are jumps.

If you are unsure how to answer a question or the respondent gives an answer that is not in the questionnaire, write neatly what answer they gave.

Stated preference game

This is the most important part of the questionnaire and therefore we need to make sure that it is done perfectly.

Read out the introduction to the respondent. The stated preference presents # pairs of options concerned with cold water *['and wastewater' if appropriate]* services. For each pair we would like the respondent to choose which they prefer. They might not like either, but we would still like them to say which they prefer. Each of the pairs is different.

Let the respondents see the options, one pair at a time. Make sure the respondent understands what to do. Take your time. Don't rush the respondent.

All questionnaires must be returned to ____ by ____*[date]*.

Quality Control

_____ *[company]* will randomly check 10% of each interviewer's work by telephone to find out whether you were polite and courteous, to find out whether you asked all the questions and, of course, to find out whether you undertook the interview at all! This is a standard quality control that we always use for our research.

GOOD LUCK!

Appendix 7:
Generic Back-check Questionnaire

This questionnaire provides a list of questions which can be used in the back-check questionnaire.Q72-Q74 refer to questions in the stated preference questionnaire (which allows direct comparison of answers with the stated preference questionnaire to be made). Therefore, the exact content of such questions depends on the stated preference questionnaire used.

Interviewer name: ☐☐☐☐☐☐☐☐☐☐ **Date:** ☐☐ ☐☐ **Time:** ☐☐ ☐☐

Introduction

Good morning/afternoon/evening. My name is ..... and I am carrying out research for ____ *[consultant]*. Can I please speak to ..... (name from recruitment questionnaire). **IF UNAVAILABLE ARRANGE A TIME TO CALL BACK.**

I understand that you were recently interviewed regarding your experiences and attitudes towards your water services and water supply. Can I just ask you a few questions about this interview as part of our quality control check.

Q69. What date was this interview?

.....

9 Don't know/Can't remember 9

Q70. How long did the interview take? **RECORD BELOW**

.....

9 Don't know/Can't remember 9

Q71. Were you asked to make choices between a number of pairs of options?

1. Yes 2. No **GO TO** Q73. 1 2

Q72. How many pairs were there? **RECORD BELOW**

..... pairs

Q73. Are you responsible for paying the cold water bill for your household?

1. Yes, solely 3. No 1 3
2. Yes, jointly 2

Q74. How many people live in your household, including children? **RECORD BELOW**

.....

Q75. Was the interview carried out in a professional manner?

1. Yes 2. No 1 2

Q76. *[if incentives used]*Did you receive any money for completing this interview?

1. Yes 2. No **GO TO END**

Q77. *[if incentives used]* How much money did you receive? **RECORD BELOW**

.....

Thank you for your help in this research

Appendix 8:
A Brief Expenditure Survey

Expenses
How much are the household's monthly expenses for the following items (January 1996)? Specify amount in Krb.

Item	Amount
Rent (housing)	
Heating	
Electricity	
Food	
Beverages and tobacco	
Clothes	
Transport	
Telephone	
Newspapers, magazines	
Entertainment	
Other items	

Have you bought any of the following items within the last year?

Item	Yes/No	If yes, specify amount
Consumer durables		
Furniture		
Car		

Have you travelled within the last year?

	Yes/No	If yes, specify amount
In the Ukraine		
Outside, country:		

Income
How much is the household income?

	Nature	Amount
Monetary income		
In-kind income 1		
In-kind income 2		
...		

Appendix 9:
Estimation of Willingness to Pay

Estimation of a utility function

From the answers of the stated preference questions a utility function can be estimated. The utility function evaluates the alternatives by tariff and service characteristics.

The theoretical approach to the estimation of willingness to pay higher tariffs is that of microeconomic consumer theory. In consumer theory, individual consumers choose consumption bundles to maximise utility. In stated preference games, the respondent is asked to choose an alternative between two alternatives, A and B, so this is a discrete choice. Letting U represent the utility function respondent i will choose the alternative that implies the highest utility:

$$U(x_{1i},x_{2i},..,x_{ki}) = \max\left[U(x_{1i}^A,x_{2i}^A,..,x_{ki}^A),U_i(x_{1i}^B,x_{2i}^B,..,x_{ki}^B)\right]$$

The alternatives are described by a number of attributes, x_1, x_2,..,x_k, and these attributes are different for each respondent and each choice. The choice of the consumer reveals the consumer's preferences among the alternatives.

A probability model is used in order to allow for uncertainty. The probabilistic model is used in order to be able to allow effects of unobserved variation among the respondents and to take pure random choices into account as well as errors due to measurement or incorrect information. The random utility approach was formalised by Manski (1977)[26]. Let V_i be the random utility of consumer *i*:

$$V_i = U_i + \varepsilon_i$$

Here U_i represents the observed part of the respondents i's observed utility while ε_i represents the unobserved or random part. The unobserved part, ε_i , is assumed to be independently and identically distributed. When uncertainty is introduced, the choice is treated as a random variable, and the choice probability of alternative *A* then equals the probability that the utility of alternative *A* is greater than the utility of alternative *B*.

Letting *P* denote a probability, this can be written as:

$$\begin{aligned} P_i(A) &= P\left[V_i^A + \varepsilon_i^A \geq V_i^B + \varepsilon_i^B\right] \\ &= P\left[V_i^A - V_i^B \geq \varepsilon_i^B - \varepsilon_i^A\right] \end{aligned}$$

In other words, the choice probability of alternative A is a function of the differences between alternative A and alternative B.

In order to estimate the model, a probability function and functional form of the utility function must be specified. The cumulative logit function, $\Lambda(\ )$, is applied and the utility function is assumed to be of a simple linear form. The probability of choosing A can then be written as follows:

$$P_i(A) = \Lambda\left[\beta_1 x_{1i} + \beta_2 x_{2i} + .. + \beta_n x_{ni}\right],$$

where $x_{1i} \equiv x_{1i}^A - x_{1i}^B$, $x_{2i} \equiv x_{2i}^A - x_{2i}^B$ etc. and the standard deviation is normalised to 1.
In order to take heterogeneity among respondents into account, socio-economic variables are allowed in the model. The socio-economic variables reflect the different preferences about the attributes

included in the game, and are included by letting the coefficients of the utility function vary for different groups of respondents. Let s denote a variable defining socio-economic groups such that s_i denotes the membership of respondent i. Hence, the coefficients for the attributes in the games are different according to the membership of the respondent.

$$P_i(A) = \Lambda[\beta_1(s_i)\, x_{1i} + \beta_2(s_i)\, x_{2i} + .. + \beta_k(s_i)\, x_{ki}]$$

The model is estimated by maximum likelihood. This estimation method gives unbiased and efficient estimates. The method is described e.g. in Greene (1993)[27].

Results of the Stated Preference games

The estimated parameters are evaluated with standard statistical tools and common sense. The t-statistics is used to test if a parameter is significantly different from zero – this is the case when the t-statistic is greater than 1.645 for a single sided test and 1.96 for a double sided test.

Calculation of the willingness to pay

The willingness to pay is calculated from the parameter values. This is done by dividing the parameter for the service level(s) of interest by the tariff parameter. By this method the value of a service level is measured in the same units as the tariff.

$$WTP = \frac{Parameter\ \ for\ the\ service\ level\ of\ \ interest}{-\,Parameter\ \ for\ the\ tariff}$$

Uncertainty of the WTP

The standard deviation of the willingness to pay estimates cannot be obtained directly when calculating the WTPs. Two methods are possible to obtain standard deviations: Monte Carlo simulation or bootstrapping. Applying the former solution one has to make an assumption of the distribution that the estimates follow and usually, the normal distribution is assumed. The bootstrap is preferable, since the empirical distribution is used and any assumptions on the distribution can be avoided.

Bootstrapping is sampling with replacement, cf. e.g. Davidson and MacKinnon (1993). From the original sample one observation is picked, registered and replaced. This is done until one has a new sample consisting of the same number of observations as in the original sample. From this new sample a new set of parameter estimates is obtained. This procedure is iterated a large number of times and in this way one can calculate empirical standard deviations, lower and upper bounds of the willingness to pay estimates.

26 Manski, C. 1977. The structure of random utility models. Theory and Decision 8, 229-54.

27 Greeene, W.H. 1993. Econometric Analysis. Second edition. Prentice Hall.

Appendix 10:
Screening of Key Actors

The table below is a checklist to be used when identifying and describing key actors. To be used at analysis at level 3 and 4 when conducting analysis of political acceptability.

Table: Checklist: Categorisation and description of possible actors

Actor in the Policy Network	**Impact of Price Rise**[28]	**Determining Factors**	**Possible Reactions**
Decision Makers			
National administration	Investment in one city is not likely to be their direct responsibility.	The size/importance of the city (e.g. is it the capital?).	It becomes a national political issue, possible conflict between national and local approaches.
	Could require revision of existing legislation (price controls etc.).	Do the increases contradict present legislation?	Possible difficulties of administrative inertia.
	Could allow testing of a new approach to utility charges.	Is this a test case with regard to utility charges?	If it is a test case then likely to be supportive
	May allow meeting of other obligations (e.g. EU membership requirements)	The nature of these "other" obligations.	If these "other" obligations are politically important then likely to be supportive.
Local administration	May have to implement much of system.	If ownership of utility is public.	Possible difficulties of administrative inertia.
	Could increase revenues.	If ownership of utility is public	If is publically owned then likely to be supportive.
	Could limit scope for taxation in other areas.	Level of increases compared to other taxation burdens (depends on relative priority given to water).	Possible resistance.
	Will facilitate urban development.		Likely to be supportive.
National political parties	Investment in one city is not likely to be a national issue.	Strategic importance of the city, political influence of local politicians, is party running local government different from central government?	Any one of the factors 1-3 could make this a national political issue in which case different political parties will behave in much the same way as local political parties (see description below).
	May have to revise national legislation (price controls etc.).	Will legislation have to be revised (e.g. price limits removed?)	
	If a new initiative, may become a policy issue.	Do prices set a precedent?	

28 It is assumed that any price rise will also result in a corresponding increase in services compared to a situation without the price rise

Actor in the Policy Network	Impact of Price Rise[28]	Determining Factors	Possible Reactions
Local political parties	Provides a major new political issue and therefore a chance of gaining support but also a risk of losing support.	A party's position will depend on many factors: • importance of raised charges as a political issue, • the popularity (or not) of the new charges, • if in opposition or not, • how its electoral constituency is directly effected, • the approach of coalition partners, • strength of its political position, • proximity of elections.	Different parties taking different positions. Likely resistance if revisions seen to be politically unpopular. The ruling coalition likely to be in favour - if this is their project - although the reverse if true if it's one they inherited from their predecessors.
Other regulatory bodies	Investigation by anti-monopoly bodies and consumer protection bodies.	The degree to which these bodies are politicised.	In principle there should be a neutral investigation. These bodies may take a tough stance as they will be keen to ensure that their authority is not eroded.
Individual politicians	Potential campaigning issue to gain popularity.	Could be a major issue for politicians from constituencies effected, or those which have close links to any of the involved stakeholders that are actively interested in the price increases.	Political campaigning
Pressure Groups			
Consumer groups (e.g. tenants associations)	Increased prices on members but also improved services. An issue to campaign with.	The precise effect on their members. The analysis of the group's own experts.	Likely to oppose unless investments will bring substantial benefits. Likely to demand service guarantees and monopoly controls.
Environmental groups	Investment likely to improve environmental standards. An issue to campaign with.	The degree to which environmental concerns are taken into account.	Probably in favour - may want greater environmental emphasis.
Socially vulnerable groups	Increased prices may make services unaffordable. An issue to campaign with.	Magnitude of affordability problems. Degree / structure of subsidisation for socially vulnerable.	Likely to be hostile unless subsidies can ensure affordability.
Public health lobby	Investment likely to improve health standards. An issue to campaign with.	The degree to which health concerns are taken into account.	Probably in favour - may want greater health emphasis.

Actor in the Policy Network	Impact of Price Rise[28]	Determining Factors	Possible Reactions
Industrial users	Increased prices mean that affordability could be for industrial users. Possible loss of competitiveness against firms with lower charges.	Dependence on water use for industrial process. Financial well-being of the enterprise concerned. Scope for making savings through efficiencies (e.g. meters) Expectation of being exempted from the charges (e.g. private vs. public). Degree to which increased charges will have an effect on production costs.	Likely to oppose unless investments will bring substantial benefits. State owned industry may lobby for subsidies to offset the charges.
Public services	Increased prices and possible affordability problems.	Dependence on water use for carrying out of functions. Scope for making savings through efficiencies (e.g. meters) Expectation of increased subsidies or of being exempted from the charges.	Likely to oppose unless investments will bring substantial benefits. Likely to lobby for subsidies to offset increased charges.
Water Industry			
Management of utility	Increased revenues.	The actual management structure (there are many public / private variables)	In favour as it will allow development of their function.
Investors in the utility (including international investors)	A return on their investment.		In favour - a potentially strong lobby for reforms.
Employees / Unions	Increased revenues to their employer.		In favour, increased revenue is likely to guarantee jobs and allow wages to be paid / increased.
Suppliers of goods and services to the utility	Increased revenues to their customer.		In favour, will allow utility to meet its debts.
Other Actors			
Media	A possible issue on which to campaign and sell more papers. A chance to attack / support political parties.	Editorial stance on: local govt., private sector, foreign ownership / investment. Degree of factual information supplied to journalists	Likely to vary from paper to paper - but potentially hostile.
Other utilities	Increased tax burden on population may limit on their own ability to raise user charges.	The scale of the raise in comparison to other utility charges.	Potentially hostile.

Appendix 11: Example of Information Note

The object of the note is to inform the employees of the recipient and inhabitants in the city about the ongoing planning process. The proposed text is an example that cannot be applied directly. Instead, the text should be modified according to the work that is taking place in the city.

The information included should cover the opportunities considered, i.e. if improvements of both drinking water and wastewater treatment are considered or if the investment is planned to avoid a deterioration of the current services. Likewise, the note should describe the work undertaken, e.g. the level of policy analysis and the content and implementation of the survey among the inhabitants. Finally, the actual names of the recipient, the consultant and the local partner should replace the text in parentheses in the text below.

Information note regarding the water services

The *{Recipient}* is planning to invest in improved water services, and in order make the most adequate investments research is currently being undertaken. The aim of the work is to design the future water services such that they correspond to the services demanded by the inhabitants in the city.

The aim is to improve both the quality of the drinking water, and the standard of wastewater treatment ensuring that the city preserves the environment surrounding the city.

In order to fulfil the goal, the *{Recipient}* is co-operating with the *{Consultant}* and the *{Local Partner}*, and the work includes analysis of the technical opportunities, the attitudes and preferences of the users and the political standpoints regarding the water services.

Following this line the *{Recipient}* has initiated a survey on water services. The survey is prepared by the *{Consultant}* and implemented by the *{Local Partner}* who will interview 150 households during this month. The interview includes issues regarding water quality, water use, wastewater treatment, as well as information on household size and income.

The *{Recipient}* and the *{Consultant}* will in co-operation analyse the result obtained, and design a future water system, which is both affordable and provides the services demanded by the inhabitants.

Appendix 12: Glossary

Term	Description
Conjoint analysis	A set of hypothetical choice situations where respondents chose between two alternatives
Contingent valuation data (CV)	Data obtained by asking respondents to value a given commodity
Financial envelope	The interval of potential revenue given service level and price
Guesstimate	Estimate based on casual empirical material
Income elasticity	The percentage change in water demand as a response to a 1% increase in income.
Issue network	A particular type of policy network that is characterised by being poorly institutionalised and relatively open to new participants.
Macro data	Data describing the entire society (town, region or country)
Maximum likelihood estimation	Estimation method based on probability theory
Policy community	A particular type of policy network that is characterised by being highly institutionalised and with restricted "membership".
Policy network	A more or less stable institutional arrangement aimed at facilitating the interaction between public actors and interest groups in the framing of public policy.
Political acceptability	The attitude of decision-makers to a specific issue, e.g. water sector investment that entails changes in water tariffs.
Price elasticity	The percentage change in water demand as a response to a 1% increase in price per cubic meter
Public acceptability	The attitude of the general public to a specific issue, e.g. water sector investment that entails changes in water tariffs
Revealed preference data (RP)	Data describing preferences via consumers' actual choices
Stated intention data (SI)	Data obtained by asking respondents how they would react to a given situation
Stated Preference data (SP)	Data obtained via a set of hypothetical choice situations
Stated Preference game	A set of hypothetical choice situations where respondents chose between two alternatives
Take-or-pay agreement	An agreement whereby the buyer (typically a municipality) commits to buy a minimum amount each year, say a given volume of water. These arrangements are often used as part of BOT contracts for, say, a water intake and treatment plant. The agreement reduces the revenue risk for the seller (and transfers part of this risk to the buyer).
Technical profile	Description of the technical situation containing a number of simple indicators and service characteristics
Utility function	A mathematical representation of individual preferences
Water balance	The gross domestic per capita unit water consumption, and an estimate of unaccounted for water.
Willingness to pay	The willingness to pay is the (expected) payment a user is willing to pay (positive or negative) for a given service/product or a given change in service level or product attributes.