The Priority Environmental Investment Programme for South Eastern Europe (PEIP)

Strategies for Reform

A Manual for Water Utilities in South Eastern Europe

REGIONAL ENVIRONMENTAL CENTER

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REGIONAL ENVIRONMENTAL CENTER

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ACP	Apa Canal Pitesti
BiH	Bosnia and Herzegovina
BOT	Build-operate-transfer
CEE	Central and Eastern Europe
CRM	Customer relations management
CW	Croatia Waters
CSE	Communal service entreprises
DABLAS	Danube and Black Sea Initiative
DANCEE	Danish Environmental Assistance to Eastern Europe
EBRD	European Bank for Reconstruction and Development
EC	European Commission
EU	European Union
EUR	Euro
FBiH	Federation of Bosnia and Herzegovina
FOPIP	Financial and Operational Performance Improvement Programme
FYROM	The former Yugoslav Republic of Macedonia
HRK	Croatian kuna
HUF	Hungarian forint
IBNET	International Benchmarking Network for Water and Sanitation Utilities
IFI	International financing institution
IMIR	Integrated technological control system (Hungarian: Integralt Muszaki Informacios Rendszer)
ISPA	Instrument for Structural Policies for Pre-Accession
KfW	Kreditanstalt für Wiederaufbau (a German bank)
KTA	Kosovo Trust Agency
NGO	Non-governmental organisation
NRW	Non-revenue water
PEIP	Priority Environmental Investment Programme

PLC	Public limited company
PPIAF	Public-Private Infrastructure Advisory Facility
PPP	Public-private partnership
PSP	Private sector participation
PUC	Public utility company
REC	Regional Environmental Center for Central and Eastern Europe
RS	Republika Srpska (Bosnia and Herzegovina)
SCADA	Supervisory control and data acquisition
SEE	South East Europe
UfW	Unaccounted-for water
UWWTP	Urban wastewater treatment plant
ViK	Vodovod i Kanalizacija (water and sewerage company)
WB	World Bank
WWRO	Water and Waste Regulatory Office (in Kosovo)
WWTP	Wastewater treatment plant

Preface

The present water utility reform manual has been drafted within the Priority Environmental Investment Programme for South Eastern Europe (PEIP). One of the main goals of PEIP is to facilitate and speed up investments in key areas like water, waste and air. The drafting of the manual was inspired by the authors' firm belief that sustainable environmental investments in the water sector are only possible if implemented by strong, professional and independent utilities. This view has been recognised by the countries of South Eastern Europe (SEE) and the idea of the manual was endorsed at the PEIP regional meeting in Budva, Montenegro, in June 2008.

The presumption behind this manual is that the capacity of the utilities is the main bottleneck to investments in water infrastructure, rather than the availability of funding. Stronger water utilities are, and will be, able to attract and make full use of more EU and bilateral donor grant funds as well as funds from international financial institutions (IFIs) and other commercial banks.

Unblocked investments in water supply and wastewater treatment will bring countries closer to compliance with the EU environmental acquis, that is, with the major, investment-heavy EC directives on urban wastewater treatment and drinking water. Of course, the ultimate goal remains better services for the population and additional environmental and health benefits.

Marta Szigeti Bonifert
Executive Director
Regional Environmental Center for Central and Eastern Europe

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Introduction

Investments in the water infrastructure in SEE are urgently needed in order to provide all members of the population with drinking water, to improve its quality and to reduce pressure on the environment through the treatment of wastewater. Municipalities, and therefore water utilities, are the main actors in water supply and wastewater treatment projects, thus their capacities are scrutinised by all potential financers — the European Commission, bilateral donors and IFIs. Currently, the water utility sector is also facing serious challenges related to EU accession, the demand for new customers and the general economic downturn.

On the one hand, it should be of the utmost importance for national governments to embark on reforms of their water utility sectors. Some countries are already doing this in practice; in other countries reform is still being discussed. On the other hand, much depends on the water utilities themselves. They will only be able to address all these challenges if they improve their basic operations. This manual is targeted mainly at practitioners in the utilities and local governments, although national policy makers, financers, NGOs and customers might also find it useful.

The Priority Environmental Investment Programme was designed to facilitate investments in several sectors, including water. Our belief is that this manual will play a significant role in guiding water utility managers in undertaking either partial or more comprehensive reforms. Only after water utilities have reached certain management and cost recovery benchmarks will they be ready to attract funding for infrastructure investments. The better organisational and financial health of the water utilities will also serve as a guarantee that the newly built infrastructure will be utilised optimally and yield the intended environmental benefits.

During the drafting of the manual the global economic crisis deepened and hardly any area of life is unaffected by it. Due to the financial and economic crisis some of the problems faced by water utilities are escalating — for example, the non-payment of bills, difficulties in accessing loans, and smaller subsidies from states that are suffering from greater budget deficits than before. Many banks and investors have less capital. We are also observing a devaluation of currencies in Central and Eastern European, which increases pressure for the repayment of loans. All these reasons mean that financiers are less inclined to take big risks and would rather invest in solid and well-managed operations. In these new circumstances, the reform proposals are even more relevant today than they were a year ago.

There are several manuals and guidelines available that focus on different aspects from among the complex measures that are referred to by the present authors

as water utility reform. However, what has been missing so far is a single document combining all the relevant and urgent measures for water utilities in SEE. The present manual aspires to fill this gap. It also attempts to tailor the necessary interventions to the concrete needs of the countries of the SEE region, and as such is based on an overview of the existing situation in the region (Chapter 1).

Chapter 2 deals with the institutional reform of the water utilities. The chapter provides guidance for the preparation of this process — through corporatisation as one of the first steps in utility reform; and through private sector participation as a possible way to streamline operations, cut costs and provide additional capital. Suggestions are tailored to the situation in the countries.

Chapter 3 focuses on organisational reform at the utility level, starting with better strategic planning and dwelling on the topics of human resources management and options for cost savings. The financial difficulties of a company can generally be eased in one of two ways: reducing expenditure or generating additional revenue. There is much room for improvement in both these areas. This chapter focuses mainly on how to save on labour costs; take advantage of economies of scale; utilise the power of competitive markets through outsourcing; and lower operating costs through proper investments. The chapter also introduces the relatively new concepts of benchmarking and independent performance audits, and makes the link to the development of information systems as a prerequisite for better utility management.

Chapter 4 tackles the other side of the equation and is devoted to enhancing revenues through suitable tariff designs; adequately high tariffs to ensure cost recovery; the improved collection of tariffs; and shielding the poor from the adverse effects of higher bills.

Chapter 5 comprises three case studies from Croatia, Albania and Hungary, which illustrate some of the theoretical aspects of the text.

Chapter 1

Overview of utility status in South East European countries

The information presented in this chapter is based on a survey conducted by the authors in autumn 2008. The survey is complemented by information from national workshops in Albania, Croatia, Montenegro and Serbia; individual interviews with key stakeholders; and already published national and regional reports.

This chapter introduces the general situation in the region, which is summarised in Table 1, as well as some specific characteristics of the countries. Where relevant, there is more detailed analysis of a particular aspect of the water utility sector under each individual chapter.

The water utilities in all SEE countries face more or less similar problems, although their severity varies from country to country. Some of the common problems are:

- relatively low level of drinking water supply for the population in rural areas;
- big water losses due to ageing water supply infrastructure;
- significant unaccounted-for water (UfW), a major part of which is the water loss mentioned above;
- poor operating efficiency of the utilities;
- water and wastewater tariffs not set at a level for cost recovery;
- a large proportion of unpaid bills.

All these problems lead to low levels of operating-cost recovery, that is, the ratio of tariff revenues to operating costs.

Table 2 on page 15 is based on the IBNET survey carried out by the World Bank (WB) and provides a summary of this information, supplemented with data from some of the other Central European countries. We have also included several Central European countries for comparison. Data are missing for countries where the survey was not carried out.

These figures suggest that many water utilities in the region face daily financial difficulties, threatening the provision of services. Moreover, it is not enough simply to cover current operating costs: in many cases there is a need to improve the quality and reliability of services, which requires additional resources. The extension of operations, such as developing new networks and building wastewater treatment facilities, is yet another area that requires even more money. It is clear that most water utilities need to stabilise their cash flow, and then continuously enhance it, otherwise it will simply not be possible to cope with the numerous challenges faced by the sector.

Albania

According to the WB survey, only one of the 55 surveyed Albanian utilities had an operating-cost recovery ratio of more than 1.00, while the average figure was 0.47. This means that, on average, the tariff revenues cover less than half of the operating costs, the rest of the revenue being supported by subsidies. However, the plan is to phase out subsidies in Albania.

TABLE 1: **Overview of the status of water supply and wastewater in SEE**

	ALBANIA	BiH	CROATIA	FYROM	KOSOVO*	MN	SERBIA
Number of water utilities	56	136	98	84	7	21	150
Number of wastewater treatment plants	1	8**(4% of population)	89 (28% of population)	5*	0	2	28**
Proportion of population supplied with water***	85% (urban) 65% (rural)*	91% (urban) 48% (rural)	80%	72%	44%**	80%	83% (urban) 49% (rural)*
Proportion of population connected to sewerage system	40% (1% of which is rural)	73% (urban)	70-75%** (urban)	70% (urban) 15% (rural)	28%**	38%	60%**
Water losses	big	50%	40%	10-60%	NA	NA	35%
UfW	67%	NA	67%	up to 60% (NRW)	59%	50-75% (NRW)	NA
Unpaid bills	27%	30%	NA	40-80%	43%	25-40%	40%
Staff per 1,000 connections	13	10	NA	NA	7.6	8-12	NA

Source: REC survey

* Kosovo as defined under UNSCR 1244

** Data from REC report "Municipal investments in water and waste infrastructure in SEE, 2007"

*** There are a number of rural settlements that do have their own — public — small-scale water supply systems, but these systems are usually maintained by the local population (i.e. there is no water utility as such involved).

For the last two years, the water supply and sewage sector in the country has shown important improvements, from both a technical and financial point of view. Although improvements have been made, many deficiencies in the water sector continue to exist, especially in rural areas.

In 2007, the Government of Albania launched an extensive reform of the water supply and sewage sector. The initiative was based on decentralisation and commercialisation involving all line ministries and relevant bodies. The Albanian reform is an example of how strong political willingness and individual leadership on the government level can create the momentum for comprehensive and concrete reform measures. Clear responsibilities for each individual measure would greatly increase the probability of their implementation.

During 2007 and 2008, the ownership of the utilities has been completely transferred from the government to local authorities. The reform aims at defining a national policy and programme for all water supply and sewerage utilities to become financially self-sustaining.

The first, pioneering example of regionalisation in Albania is the merger of the Berat and Kucova water companies, which was completed in 2008, seven years later than initially planned. A EUR 6 million grant by the German Government is the incentive for this merger and will be used to (re)construct the water supply infrastructure. (REC Survey and Patozi and Olldashi, 2008)

Bosnia and Herzegovina

In Bosnia and Herzegovina, water supply and wastewater services are the responsibility of more than a hundred water utilities, which are owned and controlled by municipalities. The current operational and financial condition of these utilities is generally weak. According to a UNDP study, none of the utilities are profitable or able to generate sufficient revenue to cover expenses. The continuing poor financial situation in the country is effectively hampering efforts to improve the water and wastewater services (UNDP/GEF 2004). Some 56 percent of the population has access to water supply, while the urban connection rate is 91 percent. Seventy-three percent of the urban population is connected to a wastewater system. In Republika Srpska, 48 percent of the population is supplied by a public water supply system.

The two state entities, the Federation of Bosnia and Herzegovina (FBiH) and Republika Srpska (RS) have their own laws that impact the delivery of water and wastewater services, affecting most technical, administrative and financial aspects. There are two public companies for watershed areas in FBiH, while the administra-

TABLE 2: **Operating-cost recovery values for Central European water utilities**

COUNTRY	YEAR	NUMBER OF UTILITIES SURVEYED	AVERAGE VALUE	PERCENTAGE OF UTILITIES WITH A VALUE ABOVE 1.00
Albania	2007	55	0.47	2%
BiH	2004	16	1.13	25%
Croatia	2004	16	1.10	50%
FYROM	NA	NA	NA	NA
Kosovo*	2006	7	1.00	43%
Montenegro	NA	NA	NA	NA
Serbia	NA	NA	NA	NA
Czech Republic	2005	9	1.39	100%
Hungary	2004	22	1.18	73%
Romania	2004	24	1.07	58%

Source: www.ib-net.org, except for Kosovo as defined under UNSCR 1244 (WWRO, 2007a)

Notes: For each country, the most recent year with available data was selected.

In Hungary, all utilities had an operating-cost recovery ratio above 0.9, which suggests relatively stable operation, even though not all of them reached the 1.00 level. In Romania, two companies had values below 0.90.

* Kosovo as defined under UNSCR 1244

tion in RS is highly centralised. There is no national body regulating tariff setting. No reforms of the water utilities have taken place, either in FBiH or in RS. The Water Law, at state level, was passed in 2006 and has been in force since January 2008. The process of transposition is ongoing and the water management strategies for FBiH and RS will be completed by the end of 2009. Some individual reform initiatives are outlined in the new legislation, such as the merging of public enterprises for catchments of the Sava River basin and the Adriatic Sea into the Agencies for the Water Area of the Sava River and Adriatic Sea. The transformation of the Republic Water Directorate in Republika Srpska is foreseen by the Water Law. However, the transformation will be carried out after the finalisation of the reform of the ministries in RS. Private participation in the water sector is not yet developed, although the increasing of private sector capital is being considered. (REC Survey and UNDP 2004[1])

Croatia

According to the IBNET survey by the World Bank, the value of operating-cost recovery for 16 water utilities in Croatia, the country with the highest GDP in the region, was 1.10 in 2004. Half of these companies did not reach the threshold value of 1.00, suggesting that the short-term financial sustainability of these companies is at risk.

No systematic reform of the water utilities has taken place. Responsibility for managing water is centralised under the governmental institution, Croatian Waters. The water utilities are publicly owned in the form of communal company, communal institution, or individual facility owned by the local government. Croatia has a long tradition of communal companies in the water sector, and any future reform should strive towards lowering their number and increasing their efficiency.

So far there have been reforms only on individual utility level. Communal companies in medium-sized and large towns have reached full cost recovery for their operations, although in most cases the price of services does not reflect the real costs of operation. The underestimated tariff setting leads to a situation in which systems are not well maintained; facilities are old and depreciated and some are not functioning; interventions take place only at critical points; and big water losses exist. The technical performance of the utilities in Croatia is regarded as better than average in the region. (REC survey)

The former Yugoslav Republic of Macedonia

In the former Yugoslav Republic of Macedonia, communal service enterprises (CSEs) are public enterprises founded and owned by local governments. For the purpose of providing communal services for the territory of two or more municipalities, the municipalities can establish joint CSEs. Water facilities are usually poorly organised and suffer from poor operational capacities. The CSEs operate on the border of cost-effectiveness — that is, they have minimum income that does not allow for any bigger investments. Tariffs are generally too low, resulting in insufficient resources for capital maintenance let alone infrastructure investment. Low tariffs combined with the lack of will to reform municipal enterprises result in insufficent financing of EU-compliant wastewater treatment. With regard to the ex-

tent of the construction of sewerage networks in settlements and of urban wastewater treatment plants, the country lags behind in comparison with water supply networks. Payment collection has improved but still remains insufficient.

The water supply system is relatively developed and reaches 72 percent of the population of the country, although there are persistent problems such as a high level of unaccounted-for water. There are seven urban wastewater treatment plants that connect 12 percent of the population. Several projects supported by IFIs and bilateral donors are preparing for reforms of the water sector in the former Yugoslav Republic of Macedonia. The government strategies outline specific tasks for the water service. A minimum service standard will be established for calculating the costs of services, raising the level of grants and developing an effective fiscal equalisation. (REC survey)

Montenegro

In Montenegro, local governments form water supply and wastewater public utility companies (PUCs). The assets remain in the hands of the central government. The municipalities are responsible for the provision of services and the government is responsible for capital repair and the replacement of depreciated fixed assets. Although on paper the PUCs are legally independent entities, they have little autonomy and limited control, for example over tariffs, the hiring and firing of staff, and investments. Montenegro has a relatively well developed water supply system, connecting 80 percent of the population. The sewerage system is less well developed (connecting 38 percent of the population). Two wastewater treatment plants operate in Podgorica and Niksic. Water shortages are common and the level of unaccounted-for water is high.

The Water Utility Reform Plan, adopted by the Government of Montenegro in July 2007, addresses the structure, ownership, governance, performance and financial sustainability of the water utility sector, although no reform actions have yet been implemented. According to the reform plan, assets and ownership should be transferred to the local government, which will be fully responsible for compliance with all established laws and regulations related to service standards, tariff rates and pricing, and the collection, treatment and disposal of municipal sewage. The Ministry of Tourism and Environmental Protection is identifying interested donor organisations to support further implementation of the Water Utility Reform Plan. Examples of regionalisation exist in the coastal region, such as the joint service and coordination company VODACOM, which was established in the Tivat region. (REC survey)

Serbia

In Serbia, the PUCs are owned by the municipalities. Each town and municipality has its own water utility. The technical performance of the PUCs is poor. Water loss is at an average level of 35 percent, while in some municipalities it is as high as 50 percent.

Most of the PUCs are not separated by sector (waste/water/green spaces) and

the accounting lacks transparency. It is therefore hard to separate revenues from different sectors and different services, let alone relate costs to tariffs. The service revenues are not sufficient to cover operational costs. It is commonly accepted that tariffs in municipal public utility companies are too low and that this is a major problem. Tariffs are set at municipality level, usually by a political decision that is sensitive to popular voting. This situation results in an obsolete and deteriorating water infrastructure, which in turn results in rising operating and maintenance costs.

At present there are no utilities in private ownership and, according to the applicable laws, the assets of PUCs cannot be privatised. Public-private partnerships are possible according to the legislation, but as yet there is no practice in place, nor is it expected in the near future. However, the government is considering future privatisation in the water sector, although it is not yet defined in any strategy, policy or plan. Government preparations for a reform of the PUCs are at an early stage. A reform is currently being drafted within the Ministry of Finance.

Kosovo (as defined under UNSCR 1244)

In Kosovo (as defined under UNSCR 1244), the water and waste sectors recently underwent a process of consolidation under the supervision of the Kosovo Trust Agency (KTA), whereby separate water and waste operating units associated with individual municipalities have been combined into seven larger regional water units and waste collection units. Under the overall management of the KTA, the incorporation process for the water and waste sectors commenced in February 2007. The KTA, which administered the regional water companies, ceased operations in June 2008, since which time the ownership of the PUCs has not yet been defined. It is now possible for municipalities to hand over their responsibilities for water supply to regional water companies through signed contracts that cover a wide range of rights and obligations.

The Law on Public Utilities has been drafted but still not adopted. It is expected that additional legislation will grant municipalities ownership in the form of shareholder responsibilities for the joint stock water companies. The situation for the service providers indicates that they are only just meeting their direct operation costs and that there is no capacity for the financing of capital investment, including capital maintenance. In order to achieve EU-compliant standards and to satisfy the current supply and demand imbalance, cash revenue has to increase considerably, either by increasing collection efficiency or by raising tariffs or by a combination of both. The technical condition of the water and wastewater system in Kosovo is rather poor. One of the most severe problems is water shortage: water cuts affect the population as well as the industrial and agricultural sectors. (REC survey)

Chapter 2
Institutional reform

Introduction

Status in South Eastern Europe

Water supply and wastewater services in SEE are traditionally the responsibility of municipalities. During recent reforms, the ownership of facilities has also been transferred to the municipalities. Most utility operations in the region are integrated in the municipal administration, thus the financial and operational status of the utilities tends not to be fully transparent. The municipalities lack data on income, expenses, investment needs and the quality of the services provided. Moreover, decision making regarding operations, service quality and new investments has become highly political.

Institutional reform could contribute to water utility efficiency by clarifying the question of ownership and management responsibilities. In addition, increasing the autonomy of utilities allows for more efficient operation, increased performance and access to market capital. This is what is meant here by corporatisation. More advanced forms of institutional reform include public-private partnerships and privatisation, both of which could bring in the necessary expertise and capital to achieve the desired service quality.

BOX 1: **Reform of water supply and wastewater sector in Albania**

In Albania, a comprehensive reform was launched in 2007. In addition to the transfer of utility ownership from the state to the municipalities, the aim of the reform was to further commercialise the water supply and sewerage system and to make companies self-sustaining based on long-term plans to improve performance indicators and fulfil obligations towards customers.

BOX 2: **Reform of the water sector in Romania**

In Romania, the EC and EBRD offered financial support in the 1990s for the extension and rehabilitation of the water and wastewater sector, but required the reform of utilities in order to improve operational and financial sustainability. Along with financial assistance for infrastructure development, capacity-building assistance was provided with the aim of transforming the municipal utilities into autonomous public utilities with improved operational performance, efficiency and cost recovery. Smaller municipalities were required to regionalise operations in order to increase scale and thus fundability. In this way, the Cluj water utility was turned into a regional water company providing water for Cluj, Salaj and seven small villages in Cluj and Salaj counties. Funds were received to upgrade the Cluj water and wastewater system as well as the systems of the smaller towns and villages. For larger towns, a reform strategy was implemented, in some of them ultimately aiming for private sector participation. The main purpose was to attract private capital for the necessary investments in rehabilitation and extension while improving efficiency and financial sustainability. In this way, the EU, EBRD and others provided assistance in the reform process through providing consulting, loans and grants in order to prepare the utilities for privatisation. For example, the private operator Veolia was awarded the concessions in both Bucharest and Ploiesti after a competitive tendering procedure.

BOX 3: Benchmarking in the former Yugoslav Republic of Macedonia

In the former Yugoslav Republic of Macedonia, the German bank KfW introduced a benchmarking approach before funding water supply projects in utilities. The KfW programme also introduced a quality management approach through an institutional strengthening consultant who will assist these municipalities in meeting the benchmarks in the first phase. The programme covers the municipalities of Gostivar, Tetovo, Kavadarci, Negotino, Bitola, Kocani, Gevgelija and Radovis. In addition, technical assistance for project preparation will be given through a KfW grant. For examples of the benchmarks, please see Annex 1.

BOX 4: Preparation of reform plans in SEE

Reform plans have been/are being prepared by several governments in South East European countries such as Albania, the former Yugoslav Republic of Macedonia and Montenegro. In Montenegro, a reform strategy was developed using a participatory approach involving central and local governments and involving the affected utilities. Water supply and sewerage services are seen as essential to economic growth, especially in relation to the tourism industry in Montenegro. With reform, the sector can improve its efficiency, cost-effectiveness and performance. The reforms should be accompanied by the development of new laws and the amending of existing laws, the setting up of a regulatory function, the setting up of service delivery agreements with the water supply providers, and capacity building of local governments and water utilities.

The water infrastructure investment programmes of IFIs such as the European Bank for Reconstruction and Development (EBRD), the European Commission (EC), the World Bank (WB) and the German bank Kreditanstalt für Wiederaufbau (KfW) are often accompanied by a demand for institutional reform aimed at reducing operational and financial risk by improving transparency and accountability but also by improving technical operations, service quality and organisational efficiency.

Development of policy framework

Individual utilities have a very limited impact on the development of the policy and regulatory framework but they function within it and all aspects of their management and operations are directly dependent on it. Therefore a good policy and regulatory framework in the water and wastewater sector is essential for better performance of the water utilities and for their reform.

The government must define the framework and support it by amending its strategy and policy appropriately, including decisions and laws/acts on private sector participation, liberalisation, regulation and social (financial) assistance.

In addition, a robust institutional system for the regulation of the sector is of the utmost importance for enforcement and compliance with the policy framework.

More information about the preparation of institutional reform in policies, laws and regulatory functions can be found in *Approaches to private participation in water services – A Toolkit,* developed by the World Bank and PPIAF (visit www.worldbank.org for the related on-line training).

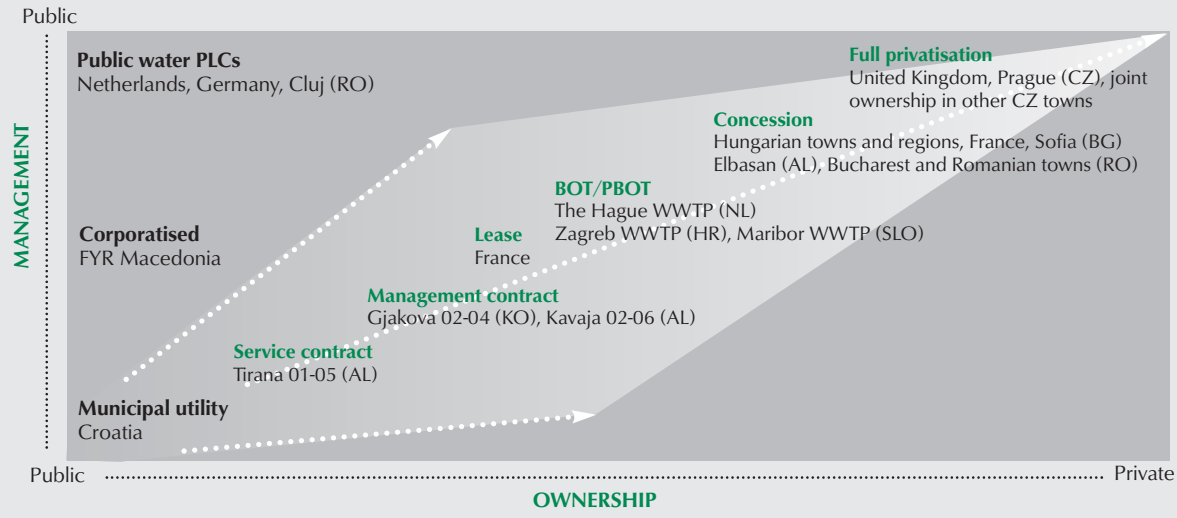
Institutional reform options

In what follows, institutional reform options are explained in greater detail and guidance is provided for the preparation of such a process. Two types of reform are described: corporatisation and private sector participation (PSP). Typically, corporatisation covers the whole spectrum of management reform required to provide the utility autonomy in its operations; PSP and public-private partnerships (PPP) entail a combination of management and ownership reform options.

Although corporatisation can be the final stop in the utility's institutional reform process, it can also serve as the basis for advanced forms of PSP. Private operators are more readily attracted to utilities that operate in a transparent environment with clear divisions of responsibilities and roles. An autonomous corporatised utility that works in a transparent way, showing accountability for its operations and finances, reduces uncertainty for private operators. This paves the way for more advanced forms of institutional reform.

Figure 1 shows an array of institutional reform options. Along the y axis, the different modes of management reform or corporatisation are presented, including some examples. Private sector participation options combine management and ownership reform. Different categories are distinguished, and some regional examples are listed.

FIGURE 1: **Institutional reform options — Corporatisation and private sector participation**



Corporatisation

Forms of Corporatisation

Corporatisation refers to the reform of the management of a utility service while ensuring the government's ownership of assets and strategic direction. Corporatisation covers all possible structures between a municipal utility and a public water company under private law (see Figure 1).

Corporatisation is seen as a means to increase efficiency, achieve cost recovery and establish sound management principles. With corporatisation, utilities become autonomously managed enterprises. By law or official agreement between municipalities and utilities, the utilities are required to become sustainable and accountable. This is a strong incentive to establish commercial financial and management principles. With organisation and financial reform, utilities can improve their operational efficiency, service performance and cost recovery/financial sustainability.

Corporatisation is a means towards performance improvement. However, it is the utility itself that has to develop a path to improved operational and financial sustainability. The following chapters present a range of organisational reform programmes and give guidance on developing and implementing these activities.

As seen in Figure 1, corporatisation starts with the reform of a municipal (government) utility. Three basic forms are distinguished:

- Municipal utility, ring-fenced department
- Corporatised utility
- Public water company

The next sections briefly introduce the three main forms.

TABLE 3: **Institutional reform: Corporatisation**

Key stakeholders	Water utility, municipality, consumers
Main impacts	• Utility becomes autonomous, accountable and sustainable
	• Basis for improvement programmes with reference to finances, operations and service quality
	• Less involvement and political influence by governmental bodies
	• Likely increase of tariff and collection efforts
	• Likely HR restructuring
Time needed	1 to 3 years, depending on scale
Cost level	• Medium investment, dependent on reform objectives
	• Possibility to increase revenues or aim for full cost recovery
	• Improvement of environmental impact by performance and quality improvement programmes
	• Likely social costs if reform goes together with an HR restructuring plan, despite benefits for those that will be included in the HRD programme

BOX 5: **Water supply and sewerage services in Croatia**

In Croatia, water supply and sewerage services are the responsibility of the local government and are provided mainly by municipal public corporations. Decisions on annual budgets, capital investments and policy are taken by the corporations' management boards, in which the mayors of the respective municipalities participate.

BOX 6: **Communal service enterprises in the former Yugoslav Republic of Macedonia**

The former Yugoslav Republic of Macedonia has organised water and wastewater services in communal service enterprises (CSEs) with separate management and financial systems. These CSEs perform the functions of operation and maintenance; the rehabilitation and extension of the systems; billing; bill collection; and customer management. However, there are no service contracts between the municipalities and the CSEs. Moreover, the municipality nominates two-thirds of the members of the management board, as well as the director. This structure can lead to heavy political interference in the day-to-day management of the municipal enterprise.

Municipal utility, ring-fenced department

The traditional option is the municipal utility, in which water supply, sewerage or solid waste activities are operated by the municipality as part of the general municipal administration. Revenues and expenses are included in the general municipal budget.

With the creation of a ring-fenced department — separating the service provision into a separate body — the government can already benefit to some extent from improved autonomy. In a ring-fenced department, the service still falls within the fixed policies, procedures and budget of the government but has separate accounts and a certain level of autonomy for day-to-day management. In general, ring-fenced departments function more efficiently but are still heavily influenced by government administration procedures and are prone to political interference.

Corporatised utility

A corporatised utility is a semi-autonomous municipal agency, where the utility service is operated by the municipality as a separate entity with independent management and accountancy under public law. In this form, the municipality's ownership of the assets is clearly separated from the corporatised utility's provision of services. Corporatised utilities are autonomous from local administration. Depending on the regulation, these separate water utilities can improve their efficiency by replacing government administration practices with commercial management principles and accounting systems, and by introducing financial and operational performance targets. If endorsed, these utilities can act as accountable and cost-recovering entities. It is even possible to attract private capital (with government guarantees) because of improved transparency and accountability.

BOX 7: **Public water public limited companies in the Netherlands**

In the Netherlands, water supply is treated as an economic activity even though private sector participation in the water sector is prohibited. Water utilities are organised as public water public limited companies (PLCs) under private law, and as such they are subject to the rules and regulations governing commercial business. This requires water utilities to be fully financially transparent and accountable to the public.

Public water PLCs are owned by the municipalities and counties in their service area, which can cover one town (such as Waternet in Amsterdam) or a whole region comprising three provinces (such as the water company Vitens). Shareholders have seats on the supervisory board, oversee the company's management, and make investment and tariff decisions.

Most Dutch public water PLCs operate on the basis of a service agreement or company permits, awarded by the owners for about 30 years. The concession agreement specifies rights and responsibilities, including exclusive permission to operate in the service area, the responsibility to provide drinking water and services according to the law and terms specified by the municipality, the tariff setting and enforcement process, as well as the requirement to transfer the ownership of the company to the authority at the termination of the concession.

Public water companies

A public water company is a municipal enterprise operated under private law. This is the most advanced form of corporatisation. Ownership (in the form of shares) is solely in the hands of the government, although the municipal enterprise acts as a commercial company subject to private sector rules and regulation. A public water company has fully introduced commercial management principles and employment conditions. In this form, the organisation may be staffed by the same managers and personnel but is now free to establish a working environment and conditions that can stimulate and motivate the workforce to function more efficiently and effectively. In essence, public water companies have to recover their full costs through the implementation of cost-recovering tariff structures, although, in the public interest, the government may decide to subsidise the utility to ensure that the tarrifs remain affordable. Another important aspect is that the public water company is also responsible for the utility's investment programmes and its (private capital) financing. For such a form to be effective, the regulatory framework should be well defined to exclude business opportunism and to encourage continuous performance and service quality improvement.

Impacts of corporatisation

The reform objectives largely determine the degree of corporatisation. By ringfencing a department, only some transparency, and thus accountability, can be gained. By corporatising a utility under public law, greater efficiency and performance improvement measures can be agreed upon. A public water company under private law is to be chosen when aiming for full performance improvement. An overview of the benefits of the different options is presented in Table 4.

TABLE 4: **Benefits of reform from corporatisation**

CORPORATISATION REFORM OBJECTIVE	RING-FENCED DEPARTMENT	CORPORATISED UTILITY	PUBLIC WATER PLC
Efficiency	No change	Not necessarily	Improved (commercial)
Service quality	No change	Not necessarily	Improved (commercial)
Transparency	Improved	Transparent	Full transparency
Accountability	Improved	Accountable	Full accountability
Full cost recovery	No change	Not necessarily	Necessary
Financial sustainability	No change	Not necessarily	Necessary

TABLE 5: **Institutional reform: Involvement of private sector participation**

Key stakeholders	Water utility, municipality, private operators, consumers
Main impacts	• Underperforming utilities become more efficient
	• Better management and service quality
	• Better access to capital
	• Likely increase of tariff and collection efforts
	• Likely HR restructuring
Time needed	1 to 2 years, depending on the type of contract
Cost level	• Medium investment, depending on reform objectives
	• Possibility to increase revenues or aim for full cost recovery
	• Improvement of environmental impact by performance and quality improvement programmes
	• Likely social costs if reform goes together with an HR restructuring plan, despite benefits for those that will be included in the HRD programme

Private participation

We are not making the assumption that private sector participation (PSP) is indispensable in order to improve the operation of water utilities. It is simply one of the options for the reform of water utilities that are underperforming, which is, unfortunately, often the case in SEE. However, different degrees of PSP should be considered together with all the other possible options for reform.

This chapter is not prescriptive in character, nor does it recommend any particular form of PSP. Instead, it discusses some of the main advantages and disadvantages of the various forms of PSP (see Table 5). Our aim is also to provide an overview of the situation in SEE as well as to present some other relevant experiences from Central and Eastern Europe.

It should also be noted that the recent financial and economic crisis has an im-

BOX 8: **Quotation**

"If we want to keep the project development momentum going, we need to evaluate innovative approaches to PPP project structuring (including the possibility of using public sector debt and equity) and designing public projects so that they can be transformed into PPP projects when the markets begin to recover and finally adjust PPP legal and regulatory frameworks to facilitate project development under these changing conditions.

There is also a possibility for the emergence of new forms of SEE-SEE cooperation where relatively well performing water utilities of the region can assist or take a stake in others from neighbouring countries. This aspect is an emerging trend in the south and surely can be boosted as well in SEE."

David Kramer, Swiss Federal Department of Economic Affairs (FDEA), State Secretariat for Economic Affairs (SECO), Economic Cooperation and Development Infrastructure Financing Division

pact on PSP. According to experts in the field, during the 2005-2008 period of economic growth and high financial liquidity, a large number of private sector investments were financed that now require refinancing. Although this is less true for SEE, it is still of some relevance. However, as commercial debt market liquidity begins to diminish with the crisis, this source of funding is also diminishing. Existing projects are beginning to face cash flow pressures as a result of non-payment by end customers. This will probably mean that, while the crisis lasts, fewer new PPP projects will be funded and any potential PPP project will be subject to greater scrutiny.

Private sector participation in South Eastern Europe

In SEE, the private sector has no tradition of involvement in the provision of water supply and wastewater treatment services. In the context of low water utility efficiency and unsatisfactory service quality, there will be greater pressure on governments and municipalities to engage in serious reforms. In this situation of utility underperformance, attracting private sector participation in running the utilities is one of the possible ways to **increase efficiency** and **improve cost recovery**. Other benefits would potentially come in the form of **improved management**, **better value for consumers** and **easier access to capital**.

Private sector participation in the region is virtually non-existent, with a few rare exceptions.

In Albania, there have been several examples of PSP in water utilities:

- Management contract financed through World Bank credit for four cities: Durres, Lezhe, Fier and Saranda. This contract expired in July 2008.
- Management contract financed through KfW for Kavaja. This contract expired in May 2008.
- Concession contract financed through KfW for Elbasan. This contract was suspended in December 2006.

In Bosnia and Herzegovina, Montenegro and Serbia there has been no private sector involvement in the water utilities.

BOX 9: **Build-Operate-Transfer agreement for Zagreb wastewater treatment plant**

In Croatia, the city of Zagreb has a Build-Operate-Transfer (BOT) contract for its wastewater treatment plant. The BOT contract is for 28 years. The project also includes the construction of supporting infrastructure. A special-purpose company — Zagrebacke Otpadne Vode d.o.o. — was set up for the project. The company is owned by a sponsor consortium comprising RWE AQUA GmbH (owned indirectly by RWE AG) and SHW Holter Wassertechnik GmbH (a fully owned subsidiary of Berlinwasser Holding Aktiengesellschaft). The EBRD provided around EUR 55 million out of the total cost of EUR 270 million.

Co-financing of EUR 115 million was provided by the German bank Kreditanstalt fur Wiederaufbau (KfW). By lending directly to the concessionaire, the EBRD is allowing the city to use its own credit capacity for other important projects.

The city will control the private company through a long-term concession contract, which sets out the discharge standards with which wastewater must comply. The project is an example of how public-private partnerships work.

The private consortium agreed to build the plant in line with EU environmental standards, to operate it, and to transfer it at the end of the concession period to the city of Zagreb. The city assumes risk in terms of the volume of water used and risk regarding the collection of the wastewater tariff.

This allocation of risk ensures that the private operator constructs the plant and operates it efficiently in order to comply with EU environmental standards, while the city has the incentive to collect tariffs to pay a fee to the operator.

(EBRD website).

TABLE 6: **Main options for private sector participation and the allocation of responsibilities**

OPTIONS	SERVICE CONTRACT	MANAGEMENT CONTRACT	LEASE	BOT	CONCESSION	DIVESTITURE
Asset ownership	Public	Public	Public	Public and private	Public	Public or private and public
Operations and maintenance	Public and private	Private	Private	Private	Private	Private
Capital investment	Private	Public	Public	Public	Private	Private
Commercial risk	Public	Public	Shared	Private	Private	Private
Tariff collection risk	Public/private	Public/private	Private	Public	Private	Private
Construction risk	None	None	None/low	High	Low	Very low
Duration	1-2 years	3-5 years	8-15 years	20-30 years	25-30 years	Indefinite (may be limited by licence)

Source: A combination of tables from *World Bank Toolkit for Private Participation in Water and Sanitation* (adjusted).

Main forms of private sector participation

There are six main forms of PSP in water utilities, with varying degrees of private participation in the ownership of physical assets such as pipes; participation in operation and maintenance; capital investments such as replacing pipes; the distribution of commercial risk; and the duration of the contract.

Experience worldwide has shown that in practice there might be mixed forms of PSP or that utilities may start with one form and extend the PSP to other forms. Naturally, the time and resources needed for the preparation of the PSP depend on its type. Service contracts and management contracts are relatively easy to prepare and administer as there is no transfer of ownership of the assets — although their successful implementation still requires great care and thorough preparation, using in-depth knowledge and experience.

The main pure forms of PSP are described in Table 6. In practice, the service contract is the simplest form of PSP and is otherwise known as outsourcing. It is a way to streamline some operations and reduce costs by outsourcing tasks such as civil works, meter reading, customer service management etc. It is the most widely used form of PSP. Service contracts have to be properly monitored in order to be efficient. More information on service contracts is provided in the section on outsourcing in Chapter 3.

The management contract is a form of PSP in which all assets ownership, risks and investment responsibilities remain with the public but only the management, operation and maintenance of the utility is entrusted to a professional management company for a fixed fee. There are ways to introduce, through the contract, further incentives for the company to realise additional efficiency gains. Management contracts bring quick technical capacity gains.

Under a lease contract a private company leases the assets of a water utility and is given the responsibility to manage them. The lease is supposed to optimise billing and collection rates and to bring down operational costs. It therefore reduces the risk of failure to collect the adequate tariffs. A proportion of the management responsibility and commercial risk is transferred to the private company. According to the *World Bank Toolkit for Private Participation in Water and Sanitation*, leases are most appropriate where there is scope for big gains in operating efficiency but only limited need or scope for new investments. The Czech Republic (see Annex 3) is the only country in the CEE region using this option on a wide scale. While a lease contract provides incentives for the private partner to improve the efficiency of operations, it can also be negotiated in such a way that either the municipality (through adjustable lease payments) or the customers (through smaller increases in tariffs) enjoy part of the efficiency gains.

The Build-Operate-Transfer (BOT) contract is typically used for building new infrastructure such as wastewater treatment plants (see the Zagreb example in Box 9). The plant is constructed by the private company and operated for a certain number of years (20 to 30), after which it is transferred to the government. Under this option, the private sector is in charge of raising capital and investments.

The awarding of a concession to a water utility is a big step towards the full pri-

vatisation of the utility. It also makes the private company responsible for investments. The private company takes over the entire management of the utility and is usually responsible for the entire water supply system. It has huge potential for gains in operational efficiency. Concessions are usually awarded in big cities with a large number of customer bases and big needs in terms of infrastructure investments and gains. It should be borne in mind that the preparation and administration of a concession is very challenging.

Divestiture is an option where assets are fully or partially sold to a private company. Similarly to a concession, it gives the private sector full responsibility for operations, maintenance and investment. Divestiture only exists in England and Wales and entails complex relations between utility owners and regulators. In continental Europe, governments are unwilling to lose control of strategically important water infrastructure.

Pros and cons of involving the private sector in the water utilities

Private sector participation in water utilities is not a solution in itself, although it can bring certain benefits especially in cases of very low operational efficiency. Table 7 highlights some typical arguments for and against PSP, which must be taken into consideration when planning reforms.

The marginal advantages of PSP could be greater in SEE, as the difference between the experience of international water utility operators and local operators is bigger. Better access to capital is also one of the strongest arguments for PSP in developing countries. Municipal and state decision makers, however, are also more reluctant to embrace PSP, mainly because of concerns over affordability and the desire to harvest some of the efficiency gains locally.

Risk allocation and the choice of PSP form

The success of a PSP project is highly dependent on the proper allocation and management of risks. When choosing a form of PSP, the government in practice transfers different types of risks (and associated gains) to the private operators. The type of PSP selected depends on the particular risk that the government wants to transfer. There are also general risks — financial, legal and political — that affect all forms of PSP.

Other types of risks include:

- Asset conditions — when the actual situation differs from the initial information. This might be the case when the technical documentation is old.
- Collection — related to levels of non-payment, which is closely linked to the economic situation. For example, in the current economic and financial crisis this risk is higher.
- Construction — related to labour costs, permits, administration etc.

TABLE 7: **Pros and cons of PSP in water utilities**

PROS	CONS
Increased technical, operational and managerial performance	Profit orientation outweighs efficiency gains
• Possibility for (full) cost recovery • Improved access to capital	Negative impact on tariffs and affordability
Increased operating efficiency	Staff reduction negatively affects employees, their families and the community
Reduced political influence	Government/municipal concerns about loss of control and power
The presence of independent, profit-motivated private providers influences government policy towards water services and the way it is enforced	Water management should be a public service per se, as water is a basic human need

Risks are closely related to responsibilities, and when selecting a PSP model it would be useful to think of responsibilities (listed in Table 6) and risks together.

The aim of PSP is to allocate the right degree of risk to the party that is best suited to bear it or control it (for example, a private operator would control non-payment more efficiently). The government should take a balanced approach to allocating risks to the potential private operator, as higher risks have a higher price. Annex 2 presents a checklist for the allocation of risks and responsibilities.

Implementation of PSP options

Private sector participation in water utilities is dependent on several conditions and factors. The higher the level of PSP, the more dependent it is on each one of these conditions and factors.

Several success factors for implementing PSP have been identified in different cases around the world:

- Relevant legal framework
- Strong political commitment
- Carefully chosen option based on the above considerations
- The chosen option makes technical, financial and political sense
- Careful communication with and creation of support from various stakeholders
- Establishing good partnership between the public sector and the private operator
- Open competitive process to select a private operator
- Sufficient time spent before the contract for testing the preferred option

Although the present manual does not focus on this aspect, it should be mentioned that PSP arrangements, especially the more complex ones, must be enforced

TABLE 8: **Forms of PSP and associated risks**

PSP FORM	RISKS PERTAINING TO THE FORM OF PSP	GENERAL RISKS
Service and management contracts	• **Very little risk is transferred:** Most of the risk stays with the government (i.e. when the utility cannot cover its costs the government bears the loss). • The risk transferred to the operator depends on the performance bonus. If there is no performance bonus, the operator bears the risk of not being paid by the contracting authority, but bears few of the risks of the water business.	• Exchange rate risks (in case of volatile currencies) affect operational costs, maintenance and construction costs as well as finance costs. • Collection risks (ability of the utility to collect its dues). • Policy risks (changes to the rules of the game).
Lease	• **Significant risk is transferred:** The private operator is responsible for all except new investments. • The risk depends on how the operator's remuneration is determined. • The risk for the operator is that tariffs may not yield sufficient revenue to pay for investments, or that subsequent governments may not stick to the rules originally agreed.	
Concessions and divestitures	• **Substantial risk is transferred:** The entire risk is transferred to the operator but also depends on the rules for adjusting the customer tariff. • The operator is entitled to all revenues.	

Source: The World Bank, *Toolkit on Approaches to Private Participation in Water Services.* 2006.

through a carefully designed institutional system involving stakeholders in a relevant and targeted way. In some cases, entirely new institutions are set up to monitor the implementation of a more complex arrangement (for example, a special municipal company — Omonit — was established to monitor the concession for the water and wastewater company in Sofia, Bulgaria). Other institutions involved in the process include the relevant ministry, utility board, contract monitoring unit, independent regulator, operator and contracting authority.

Potential tasks include monitoring and enforcing the operator's performance; monitoring and enforcing the contracting authority's performance; resolving disputes; adjusting tariffs; adjusting service standards; and maintaining good relations. For a more detailed analysis of risk allocation and institutional set-up for monitoring and enforcement please consult the World Bank's *Toolkit on Approaches to Private Participation in Water Services*.[2]

Implementation of institutional reform

Institutional reform at utility level

Depending on the type of institutional reform, the following change processes are applicable to a greater or lesser extent.

TABLE 9: **Conditions for the successful implementation of private sector options**

OPTION CONDITION	SERVICE CONTRACT	MANAGEMENT CONTRACT	LEASE	BOT (BULK)	CONCESSION (RETAIL)	DIVESTITURE
Stakeholder support and political commitment	Unimportant	Low to moderate levels needed	Moderate to high levels needed	Moderate to high levels needed	High levels needed	High levels needed
Cost-recovering tariffs	Not necessary in the short term	Preferred but not necessary in the short term	Necessary	Preferred	Necessary	Necessary
Autonomy of the utility	Unimportant	Important	Very important	Unimportant	Very important	Very important
Good system information	Possible to proceed with only limited information	Sufficient information required to set incentives	Good information required	Good information required	Good information required	Good information required
Developed regulatory framework	Minimal monitoring capacity needed	Minimal monitoring capacity needed	Strong capacity for regulation and coordination	Strong capacity for regulation and coordination needed	Strong regulatory capacity needed	Strong regulatory capacity needed
Good country credit rating	Not necessary	Not necessary	Not necessary (limited relevance)	Higher rating will reduce costs	Higher rating will reduce costs	Higher rating will reduce costs

Source: *Toolkit for Private Participation in Water and Sanitation*, World Bank, 2000 (adjusted)

Development of structure and contracts

The implementation of reform includes the separation of ownership and (part of the) service responsibilities via the creation and registration of public or public-private utility structures. A service agreement must be established between the government and the entity, defining the standards and providing the basis for regulation by the government. A service agreement can take different forms and can be applied in different institutional reform processes: it can be a statute with by-laws or a more contractual concession agreement. The type of service agreement should be chosen on the basis of the reform option. Whichever option is chosen, the agreement should clearly explain the roles and responsibilities of the different stakeholders and should define required performance and quality standards at the operational, financial, environmental and social levels. A good reference for the development of such an agreement is the 1998 World Bank Technical Paper 399 *Concessions for infrastructure: A guide to their design and award*. This paper aims to help policy makers understand the issues related to the design and implementation of a concession agreement (as well as other issues related to the awarding of concessions to the private sector). The toolkit, which provides an example of such a concession agreement, can be downloaded at www.worldbank.org. A tested model

of a public service agreement[3] for water utilities is available through the EC.

In addition, a governance structure must be set up, comprising shareholders, supervisory board and board of directors. Normally, it is the responsibility of the reformed utility to design and further develop the organisational structure. The government entities that own the assets are the shareholders. The law defines how shareholders are to be informed and consulted. Often the shareholders appoint the supervisory board to oversee the performance of the utilities.

Specific guidance on the development and implementation of public-private partnerships can be found in the EC guidelines[4], including strategies and success factors.

Consultation and communication

Public consultation and communication are crucial during the whole reform process. Both the government and the utility have to provide information, increase awareness, and establish a basis for mutual trust for the reform. This should be accompanied by a communication plan ensuring transparency and accountability to employees, consumers and stakeholders about the reform of the utilities. A communication strategy typically includes:

- an internal communications programme oriented to employees
- opportunities for public participation
- an external communications programme including a media relations programme, information campaigns and an education plan on the topics of water and water use/conservation.

In the development of such a strategy, the World Bank's guidelines "Communicating Economic Reform"[5] can be helpful.

Reform at utility level

Depending on the agreements made between government and utility operators, the utility must develop and implement organisational reforms and tariff reforms in order to improve transparency and accountability and to meet operational and financial performance standards. Further information and guidance on these types of reform can be found in Chapters 3 and 4.

Chapter 3
Organisational reform

The concept of organisational reform can cover a wide array of changes within a water utility. This chapter looks at measures that both enhance the performance of the organisation and, directly or indirectly, contribute to lower operating costs or improved services without corresponding increases in costs. Each topic in itself could be the theme of an entire book. However, due to space limitations, only a summary of one or two pages is provided for each topic, while additional (mainly Internet) resources are suggested.

Strategic planning

Strategic planning is a process during which an organisation defines its strategy, or main direction, for a multi-year period, and makes decisions about the major measures to be taken. The resulting strategy contains specified goals to be reached; resource requirements, such as capital and human resources; and a timetable. The strategic plan provides input to plans covering shorter periods, especially annual plans, and also functional and divisional plans. In addition to determining the company's desired future position in terms of markets, service areas, mergers and acquisitions, the strategic plan may also cover functional areas of operation, such as sales, production, finances, research and development, information technology, quality control, marketing, and human resources.

Water utilities in SEE countries face many challenges. Addressing these challenges requires a timescale of more than one year. Many of the foreseen investments need three or four years. The resource needs of the combined measures are massive, which again demands more time than a single year. Some of the organisational or tariff changes need gradual, multi-year implementation. National policies and the adoption of EU regulations also have a planning horizon extending over several years. All these factors imply that multi-year strategic plans are essential for water utilities in the region.

More or less all Western European water utilities create strategic plans. The practice is also widespread in the new EU member states. Some water utilities in the

TABLE 10: **Reform — Introduction of strategic planning within the organisation**

Key stakeholders	Mainly water utility management, and to a lesser extent regulators and utility owners
Main impacts	• Clear priorities
	• Matching of resource needs and resources
	• Smoother development, as annual plans are not isolated but linked through the strategic plan
	• Ultimately cost savings and improved services
Time needed	A few days every year
Cost level	Relatively low. It requires management time and possibly, but not necessarily, some consultant time

TABLE 11: **Labour reforms, training and motivation of personnel**

Key stakeholders	Water utility management, employees of the utility
Main impacts	• Reduction in costs
	• Increased productivity of labour force
	• Improvement of services
	• Possible staff cutbacks
Time needed	Approximately one year. Implementation of labour reforms depends on the utility needs. Training of personnel should be planned on a long-term basis
Cost level	It requires management time, and possibly consultant time

SEE region already make use of strategic planning, while others operate with annual plans. Some utilities are just beginning to do their own planning, where formerly strategic goals, including investment schemes, were set by the central government. There are also utilities in which planning is essentially non-existent, and operational decisions are made on a daily basis without any reference to future goals. In such cases there is a lack of planned maintenance, and only emergency repairs are carried out.

Policy makers in the region recently started to promote the idea of strategic planning. The Albanian Government, with the support of the World Bank, provides technical assistance to the water and wastewater utilities of the country to prepare five-year business plans. According to the two-year water sector reform plan (Patozi and Olldashi, 2008), this practice has already been successfully adopted by five utilities, while the rest of the companies will follow soon. The Government of Montenegro, as part of its proposed water utility reform plan, intends to require that water utilities prepare strategic plans.

When setting development priorities, existing water supply conditions must be taken into consideration. In some parts of the region, tap water does not reach drinking water standards and occasional outbreaks of illness, as well as high infant morbidity, are linked to polluted tap water. Some cities and villages have fewer than 10 hours of daily water supply, while in some areas less than half of the population has access to the water network. Utilities in the region are therefore keen first to improve water services — water quality, the reliability of supply and the extension of the network — followed by sewage collection, and finally the treatment of collected wastewater. This usually corresponds to customers' priorities, and eventually it is they who will pay for the services offered by the utility. Improving the water services will also help generate more steady revenue, and this improved cash flow will be useful in supporting subsequent investments in other areas.

While we consider it important to emphasise the importance of strategic planning for water utilities, we will not go into further detail with regard to the planning process. There is a wealth of literature on this topic and a large number of management consultants are experienced in this field. Useful guidelines on business

planning can be found at www.waterbusinessplanning.com. We will, however, provide information on some of the techniques by which useful information can be generated as input to the strategic plan.

Human resources management

Many water utilities in the SEE region suffer from poor management practices related to the planning of activities, communication with customers and control. These problems contribute to the poor tariff collection and cost-recovery rates and have a direct impact on the low bankability of the utility and its investment projects. Municipal water utilities often employ more people than required for providing the service, leading to lower labour productivity and higher labour costs. Strengthening human resources is one of the crucial challenges in improving the operational efficiency of water utilities and raising service standards.

Defining the objectives

Labour restructuring in the water utilities is very sensitive from a political, social and economic development point of view, and the strategy and objectives should therefore be properly defined and communicated. If the objectives are not credible, or are vague or poorly articulated, the utility management will have greater difficulty securing the support and resources needed for labour adjustment. One tool to help clarify objectives is strategic planning (see above), carefully describing the ultimate desired outcomes and using these as a basis for setting objectives. Special attention must be given to stakeholder involvement and communication (see also Chapter 2).

Assessing the size and scope of labour restructuring

One of the first steps in developing a labour programme is to estimate the extent of the labour restructuring required in terms of numbers, skills and work practices of the personnel. This usually involves carrying out a systematic staffing assessment that enables the management to determine the size and scope of any workforce restructuring, including potential downsizing. There are three tools that can be used when carrying out the staffing assessment and defining the size and scope of labour restructuring:

BOX 10: **Steps in labour reforms**

- Defining the objectives
- Assessing the size and scope of labour restructuring
- Developing strategies and options for labour restructuring
- Developing the key elements of a labour programme, including the training of personnel and the motivation of management staff and employees

- Staff audits or personnel inventories
- Benchmarking
- Workforce analysis

In practice, these are related and are often used together in a comprehensive analysis.

Staff audits or personnel inventories

A *staff audit* is an essential first step in assessing labour issues in the utility. Staff audits provide an up-to-date analysis of the workforce and are the basis for subsequent benchmarking and workforce analyses. They also create the necessary database for analyses of the costs of alternative severance and pension strategies.

Benchmarking

Staff costs are a major component of operating costs. Benchmarks can be useful in understanding staffing levels and, consequently, in estimating the extent of any overstaffing. The process of benchmarking will help identify main problem areas in utility operation, including the competitiveness of staffing levels and labour productivity. Labour benchmarks are also used as a tool for monitoring and improving performance and competitiveness. Examples are given in Box 11.

An important indicator for estimating staff needs and reducing redundant workforce is the number of staff per 1,000 connections. Many utilities in the SEE region report higher numbers of staff per 1,000 connections compared to levels in developed countries (between 4 and 7). For example, in Albania there are 13 employees/1,000 connections; in Montenegro 8 to 12 employees; and in Bosnia and Herzegovina 10 employees. However, it should be noted that, besides internal labour efficiency, other factors influence the value of this indicator, an important one being staff qualification. Furthermore, when evaluating the relative performance of utilities, the degree to which activities are outsourced should also be taken into consideration. A utility may have a low indicator value because its internal operations are efficient or because a lot of the activities are outsourced, or a combination of the two. Likewise, a water utility without any meaningful outsourcing may appear to have low efficiency, even though this may not be the case.

Workforce analysis

The purpose of the workforce analysis is to identify staffing requirements at the unit or operational level. A workforce analysis will help the utility managers to:

- Identify the levels and types of staff needed for future requirements.
- Make more informed decisions on the organisation of severance plans.
- Avoid the loss of critical skills (adverse selection).

BOX 11: **Examples of other labour benchmarks**

- Gross or net revenue per employee
- Total payroll costs (all employment-related expenses) per employee
- Total/functional labour costs as a percentage of sales
- Salary levels by function (adjusted to allow comparisons)
- Hourly wage rate (standard and overtime)
- Average weekly hours per worker
- Units produced per work hour (unit productivity)
- Product/service line revenue per staff-hour/full-time equivalent employee
- Training in person-days per year

Strategies and options for labour restructuring

The World Bank toolkit *Labor issues in infrastructure reform*[6] shows that, with careful planning and stakeholder involvement, labour issues can be adequately addressed during the infrastructure reform process.

The toolkit provides options and guidance on carrying out labour reforms. Table 12 presents some of these options.

Training and motivation

Training

Training is an important aspect of human resources development and is closely related to organisational development. Knowledge and skill deficiencies among existing staff are caused by inappropriate education levels but also by lack of personnel policies and strategies to attract and retain qualified staff. Training should be

TABLE 12: **Options for labour reforms**

TYPE	CHARACTERISTICS
"Soft" options	Application and enforcement of existing workplace regulations. Measures include: hiring freezes, payroll management, and the transfer of staff to other departments.
Early retirement and redundancy	• Voluntary departure options that provide incentives for people to leave voluntarily, either through an early retirement programme or the provision of generous severance packages. • Compulsory redundancy options, severance pay packages, retraining and redeployment packages.
Restructuring of the workplace	Include measures such as administrative leave, job sharing, part-time work and, in some cases, the shedding of non-core businesses. Staff reduction and the increasing of operational efficiency can be expedited by outsourcing certain activities via service contracts. The outsourcing should be introduced after competitive bidding and should cover, for example, meter reading, invoicing, laboratory tasks, vehicle maintenance and information technology (see section on outsourcing below).

BOX 12: **Example of labour restructuring: The Apa Nova water company, Bucharest, Romania**

The French firm Veolia won the tender for the concession for Bucharest's municipal water services in 2000. As a result, Veolia owns 84 percent of the water company Apa Nova, while the Bucharest municipality owns 16 percent. Veolia's intention was to restructure the company and reduce employee numbers by 60 percent from 4,900 to 1,900 employees. In cooperation with the Bucharest municipality, and with the commitment of employees and labour unions, the concessionaire agreed to spread the restructuring process over a longer period so that the city council could absorb the laid-off workers. In 2007, Apa Nova employed a staff of around 2,000, for whom a comprehensive human resources development programme was implemented, including skills training and the improvement of working and safety conditions.

formulated taking account of the necessary capacity development, existing knowledge gaps and weaknesses.

Areas where training and capacity building are urgently required include: business management, technical expertise, consumer awareness, needs assessment techniques and processes for facilitating dialogue and cooperation between utilities and the public. Deficiencies in personnel capacity in many SEE countries have been tackled through technical assistance programmes funded mostly by external sources. For instance, training and hands-on technical assistance to utility staff from international expert teams is a key element of KfW programmes in the region. Such initiatives will continue in the future. For example, a training programme targeting the staff of 56 utilities is to be launched in Albania in 2009. However, utility management should not rely only on ad hoc external training but should analyse training needs and develop training strategies and plans based on the specific human resources weaknesses and in line with the overall organisational development.

Motivation

Performance does not depend on staff ability alone: it is also affected by motivation. Developing professional skills through training is essential in order to keep staff motivated. Staff motivation can also be enhanced by a range of incentives, such as extra pay, career opportunities etc. Incentive packages can be designed for the management responsible for implementing the reforms.

Outsourcing

Outsourcing is the subcontracting of a process or activity to a third party, usually through competitive tendering. Outsourcing has partly been dealt with above in the comments on service contracts. The rationale behind outsourcing is that the outsourced activity will be performed at a lower cost than if the company carried it out internally. Sometimes outsourcing is driven by the desire to concentrate on core activities, while less-specialised tasks can be carried out equally well or even better by external enterprises. Outsourcing contracts usually last for more than a year, and sometimes for several years. It is our opinion that outsourcing has a lot of

cost-saving potential for water utilities in the region, since this practice is currently utilised only to a small extent.

Some of the activities that are occasionally outsourced by water utilities are: meter reading; the invoicing and collection of payments; maintenance and repair of the water and wastewater assets; sludge treatment; the operation of the IT infrastructure; the maintenance of the vehicle fleet; laboratory activities; marketing activities; security services; janitor services; real estate management; construction services; and accounting. In some cases, the management of the whole company is outsourced through management contracts, which is one of the forms of private participation (see section on private participation in Chapter 2).

Box 13 describes the key issues to consider before outsourcing a task.

The outsourcing of activities often involves laying people off, since tasks formerly carried out internally will be performed by external entities. This is a sensitive issue, but it is possible to soften the impact on employees. In one commonly applied approach, the department or unit whose task will be outsourced is first organised into a small external enterprise that is then contracted to perform the outsourced tasks for a specific period such as three years. After this, the activity is outsourced through a competitive bidding process in which the former department can also submit a bid, although this time there is no guarantee that they will be given the contract.

TABLE 13: **Reform — Outsourcing one or more activities**

Key stakeholders	Water utility management, employees of the utility
Main impacts	Reduction in costs
	Cutbacks in personnel, which may require some up-front costs
	The quality of the activity may change. It is expected to change for the better, but there is always the risk of deterioration
Time needed	A few months to a year
Cost level	Moderate initial costs, while outsourcing usually generates net revenues in the medium term

BOX 13: **Key issues to consider before outsourcing**

- Is outsourcing likely to lead to sufficient savings in costs that justify the process?
- Can operations be improved internally in order to attain the cost savings that are expected from outsourcing?
- Is there adequate expertise and experience locally, outside the water utility, to carry out the tasks?
- Are there several enterprises capable of carrying out the tasks, so that competition among them would trigger attractive offers?
- What is the strategy regarding employees made redundant as a result of outsourcing?

Regionalisation

There have been several examples, since 1990, of national governments in Central Europe handing over water utilities to municipalities. Prior to 1990, centrally coordinated companies started to act on their own, some of them breaking off into smaller entities (see Box 14). Small water utilities, however, often struggle due to a lack of specialist expertise and equipment and relatively high unit costs. The way out of this situation is what is often referred to as "regionalisation", that is, the merger or closer cooperation of individual utilities on a regional level. In this section, we will first look at the rationale behind regionalisation, then discuss the forces that are driving, or that can be used to drive, this process.

"The bigger the better." A number of factors support this notion with respect to water utilities.

- The most widely used argument in favour of regionalisation is the presence of economies of scale, that is, the cost advantage that a firm gains when it expands its production. Since production for an established set of customers is more or less given, expansion can take place either by increasing the number of connections within the existing service area, or by enlarging the service area — through acquisition or merger. The cost advantage stems from the fact that serving more customers does not require proportionately more resources. For example, the central administration of the utility, including managers, lawyers and highly specialised experts, does not need to be expanded; laboratories, certain pieces of equipment and construction vehicles often have spare capacity, so there is no need for additional purchases; and web pages and billing software do not need to be duplicated. Benchmarking studies show that larger companies, on average, have lower unit costs per customer served. However, some research suggests that there are limits to economies of scale. For instance, Mizutani and Urakami (2001) found that in Japan the optimal size of a water utility is between 700,000 and 800,000 inhabitants. Above this number, "diseconomies of scale" start to appear.

TABLE 14: **Reform — Extension of service area, usually through mergers or acquisitions**

Key stakeholders	Water utility management, employees and owners of the utility, policy makers
Main impacts	• Reduction in costs in the medium to long term
	• Increased costs in the short term due to expenses related to the restructuring of operations
	• Possibly the laying off of some of the employees and managers due to overlapping activities at merging utilities
	• Improved coordination of the use of water resources
Time needed	One or more years
Cost level	Initial costs may be substantial, up to a few percent of annual revenues

BOX 14: **The fragmentation of the Hungarian water utility sector**

In the 1980s, there were 33 water and sewage companies in Hungary, a country of 10 million inhabitants. All these companies were state owned and centrally governed. With the economic transition of the early 1990s, the assets of 28 of these companies were transferred to the municipalities, together with the obligation to provide water and wastewater services in their territory. Instead of the former state ownership and coordinated decision-making process, a large number of small municipal owners with diverse interests suddenly appeared in each of these companies, making it difficult to reach important decisions. As a consequence, large regional companies started to split into smaller ones. Municipalities that enjoyed good-quality water at a low cost and that already had a well-developed infrastructure were the first to become independent from the large regional companies, by establishing new companies based on the assets on their own territory. As a result, the rest of the service area faced higher average costs and a less attractive operating environment, which then drove the best performers within the new organisation also to abandon the company. In effect, a chain reaction was triggered, resulting in several rounds of separation. Today, there are over 300 water utilities in Hungary, and many of them serve a single municipality only. Some of the small utilities do not abstract water on their own: they buy treated water in bulk from other water companies and only operate the local network. Recently, the earlier process of disintegration started to reverse: every year there are a number of municipalities that contract larger water utilities in their region to carry out water and sewerage services for them. These smaller municipalities are aware that they lack some of the necessary expertise and specialist equipment for proper operation of the services, while they also expect that the cost, and subsequently the price, of the services can be capped by handing over operations to larger utilities. In fact, this arrangement can be viewed as a management contract, in which, instead of a private partner, municipal utilities or one of the state-owned regional companies carry out the operations of the smaller service providers.

- When the same limited water resource is used by several utilities, it may become difficult to reach an agreement over use that is satisfactory to all parties and does not overexploit the resource. If the same utilities were merged and managed by one body, then there is a good chance that conflicts of interest could be resolved. The same applies to a situation in which an upstream community pollutes the river that serves as the source of drinking water for a downstream community.
- Providing services at the same tariff level to both low-cost and high-cost locations within the service area may also be feasible within a large, regional water utility. Such cross-financing can be attractive from a social point of view, but it has some economic deficiencies (see Chapter 4).
- Investment grant schemes in the sector prefer large projects, which are more feasible for a regional utility than for a number of smaller companies together.

While, as numerous examples from the region show, there is a tendency for small water utilities to be handed over to large ones for the purposes of operation, the merger of similar-sized larger utilities is less frequent. Even if regionalisation makes sense, larger companies are reluctant to join forces, out of fears that loss of independence will result in a loss of control, or simply because the process is a nuisance. This is where governments can have a role and, as examples from several countries show, they do indeed promote regionalisation.

In Albania, according to the national water utility strategy (Patozi and Olldashi, 2008), the regionalisation of the currently fragmented water supply companies is a priority, as the government hopes that it will lead to lower service costs. A related study was to be completed by the end of 2008. The state intends to provide incentives to speed up the process of regionalisation. In fact, the first merger has already taken place among the utilities of Berat and Kucova, helped by an EUR 6 million grant from the German Government, which was used to reconstruct the water supply infrastructure serving both cities.

The Government of Montenegro in general prefers a decentralised model of water and wastewater services, but encourages regionalisation due to assumed economies of scale (WURPWG, 2007). The government's water utility reform plan proposes the establishment of grants that would be available to fund part of the costs associated with the merger of utilities, including legal costs and costs related to labour restructuring.

Cost-saving investments

Investments in a water utility can serve various purposes. Many of the new investments will expand service coverage or introduce previously non-existing technologies, such as wastewater treatment. Investments in the existing infrastructure usually contribute to improved service quality, such as continuity of service, or drinking water quality. However, some of these investments also reduce the company's operating costs. In fact, this is sometimes the main purpose — this is especially true for the reduction of leakages and for more energy efficient technologies.

Before listing some of these investment options, a few remarks will be made about the importance of cost-benefit analysis. Assuming that the sole purpose of an investment is to cut operating costs[7], it is a logical requirement that the benefits (savings in operating costs) should be greater than the costs (the cost of investments). Investments are usually one-off expenditures, while changes in operating costs take place annually. Commonly, these different types of cash flow are compared according to their present value, which is the sum of the discounted values of all the future cash flows in question. There are many resources on the Internet explaining the actual execution of the present value calculation, including the proper choice of the discount rate (as a starting point see, for example, http://en.wikipedia.org/wiki/Net_present_value)

When the present value of benefits (i.e. savings) remains below the present value of costs then it does not make sense for a cash-strapped water utility to carry out the investment — except when it is justified by other, not necessarily monetised, goals. In the case of multiple investment options, each investment should be separately valued and execution should start with the most effective investment, the investment that produces the highest net benefit[8] for every unit of the original investment, or the investment that has the shortest repayment period if financed through a loan.

Listed below are some of the investments that can lead to substantial cost savings.

TABLE 15: **Reform — Investments with an attractive repayment period**

Key stakeholders	Water utility management
Main impacts	• Reduction in costs in the medium to long term
	• Increased costs in the short term due to investments, except if they are financed from a loan or grant
	• Some investments will improve the reliability and/or quality of the service
Time needed	At least one year
Cost level	Initial costs will be high, up to a few percent of annual revenues

Reduction of water loss

The most obvious cost-saving investment, and the one probably most widely applied in Central Europe, is the reduction of water losses in the distribution network through the repair and rehabilitation of sections of the network. This is also the type of intervention that rapidly increases free cash flow, as recommended by the World Bank (2006).

There is clearly a lot of unaccounted-for water, and while this includes unbilled but consumed water, the majority of losses are technical, related to the poor condition of the distribution network. Figure 2 shows the elements comprising revenue and non-revenue water. Column D shows the technical losses and unbilled consumption for non-revenue water including unaccounted-for water.

Table 16 indicates the level of water loss in the target countries of this manual. For reference, in more developed countries an unaccounted-for water level of below 25 percent is generally considered acceptable, although the "good-practice" threshold is lower. Some of the figures in the table are average values for the country, thus there are companies with even worse performance. An unaccounted-for water level of 80 percent is not unheard of.

What are the benefits of reduced water loss? Less energy, labour and other costs are needed to abstract, clean and distribute water, and fewer chemicals are needed to clean and treat the raw water. The general condition of the network will improve, thus the number of future pipeline breaks and associated costs will also decrease. In the event of water shortages — even seasonal ones — or bottlenecks in the drinking-water infrastructure, then costly investments can be avoided by first mitigating water losses.

New technologies

Many water utilities operate with outdated and unreliable equipment throughout the technological chain. Replacing this equipment can sometimes be extremely costly. However, some new technologies will result in sizeable savings in operating costs. The purchase of some equipment may in fact produce net benefits — that is,

FIGURE 2: Elements of the water service, including unaccounted-for water factors in column D

A	B	C	D	E
System input volume (m^3/year)	**Authorised consumption** (m^3/year)	**Billed authorised consumption** (m^3/year)	**Billed metered consumption (including water exported)** (m^3/year)	**Revenue water** (m^3/year)
			Bill unmetered consumption (m^3/year)	
		Unbilled authorised consumption (m^3/year	**Unbilled metered consumption** (m^3/year)	**Non-revenue water** (m^3/year)
			Unbilled unmetered consumption (m^3/year)	
	Water losses (m^3/year)	**Apparent losses** (m^3/year)	**Unauthorised consumption** (m^3/year)	
			Metering inaccuracies (m^3/year)	
		Real losses (m^3/year)	**Real losses on raw water mains and at the treatment works (if applicable)** (m^3/year)	
			Leakage on transmission and/or distribution mains (m^3/year)	
			Leakage and overflows at transmission and/or distribution storage tanks (m^3/year)	
			Leakage on service connections up to the measurement point (m^3/year)	

Source: *Performance Indicators for Water Supply Services*, International Water Association (2006)

TABLE 16: **Unaccounted-for water in SEE**

COUNTRY	APPROXIMATE RANGE OR AVERAGE LEVEL OF UFW	SOURCE OF INFORMATION AND COMMENT
Albania	67%	Water utility benchmarking programme of Albania
Bosnia and Herzegovina	50%	REC country survey
Croatia	40%	REC country survey
Kosovo (as defined under UNSCR 1244)	59%	REC country survey. Municipal values range between 46% and 75%.
FYR Macedonia	50%	REC country survey
Montenegro	50-75%	REC country survey
Serbia	30%	MAFWM (2006)

the savings will outweigh the costs. Some of these potentially cost-saving technologies are listed below. The inventory is not comprehensive but provides an idea of the type of actions water companies can take to reduce their running costs.

Replacement of existing technologies:

- Electrical equipment. The purchase of electricity can easily make up 15 percent of all operating costs at water utilities. The actual value depends on operating conditions (depth of water wells, spatial structure of the networks), the market price of energy, and, importantly, the efficiency of the equipment. Pumps and advanced wastewater treatment equipment consume the most energy. The replacement of old pumps is a conventional method of saving energy. As an additional benefit, new pumps require less maintenance and are more dependable. According to the World Bank, energy efficiency improvements (together with demand management) represent the "low-hanging fruits" of cost savings in the region. (Nuamah, 2008)
- Vehicles and machines operated by liquid fuels. Replacing them can save both energy and maintenance costs, as with electrical equipment.
- Office buildings. The modernisation of lighting, heating, air-conditioning and office equipment can also result in considerable savings in the cost of energy and maintenance, although not on the same scale as the replacement of water and wastewater technologies.

Introduction of new technologies:

- Treatment of sewage sludge. When a water utility operates advanced wastewater treatment facilities, large amounts of sludge will be generated. The disposal of sludge in landfills is less and less acceptable, partly because of EU regulations on the extent to which biodegradable waste can be landfilled. The agricultural use of composted sewage sludge is problematic in places where the

BOX 15: **The SCADA system in Karlovac**

Between 2001 and 2004, the Karlovac water and wastewater utility in Croatia introduced a supervisory control and data acquisition (SCADA) system in order to automate the measurement and control of water extraction and water dispatch through its distribution network. The cost of the SCADA system was approximately EUR 130,000, all of which was financed from the company's internal resources. The Karlovac water utility extracts water from a system of wells, which all feed the same water distribution network. Some water storage facilities are also connected to this system. At any given time the company has a choice of which wells or storage facilities to utilise. The cost of supplying water varies according to the well and storage facility and is also influenced by the time of day, due to variations in the price of electricity. The SCADA system collects information on water pressure and water flows from certain locations in the network, and this information helps in the selection of a low-cost combination of water sources for any period of the day. The SCADA system also fulfils some tasks that would otherwise require manual labour, thus helping to reduce labour costs. While the management of the Karlovac utility believes that the SCADA system has been useful in reducing costs, unfortunately the actual level of these savings has not been estimated.

BOX 16: **The optimisation of energy costs at Nyirsegviz**

A country's electricity network can be operated efficiently if power consumption can be predicted with sufficient precision and the production, export and import of electricity can be tailored to meet demand. Since electricity cannot be stored, supply and demand must always be more or less in balance in order to avoid problems with the quality of the service. Power suppliers[9] therefore try to create tariff structures that provide an incentive to large consumers to keep to a predetermined intraday consumption schedule. Typically, large consumers need to submit, by noon each day, the planned schedule for the next day broken down into 15-minute periods. This intraday schedule must be predicted as accurately as possible, since reserving the capacity has a cost, while additional consumption beyond the reserved capacity is subject to a higher than average power tariff.

Nyirsegviz, a water and wastewater utility in eastern Hungary, makes its power purchases based on the method described above, relying on an intraday schedule[10]. The company uses a sophisticated process control system to ensure that the predetermined schedule of electricity consumption is maintained. The integrated technological control system (IMIR) continuously collects information about the operation of the water and sewerage system, the capacity utilisation of the technologies, and the flows of water and wastewater. Based on these data, the IMIR can forecast the company's electricity consumption for each 15-minute period. If this value is above the scheduled power use, then the IMIR will automatically scale back performance of those technologies (such as gusting air into the sewage treatment tanks) where timing is not critical and where delays in full-scale operation will not cause problems. (Csurka, 2008)

The price of electricity depends not only on keeping to the schedule: it also depends on time of day. Power is more expensive during the day than late in the evening, and is cheapest during the night. Like most other water utilities in Hungary, Nyirsegviz attempts to make the best possible use of these differences in price. For example, they fill puffer capacities and storage facilities during the night at low cost, reducing some of the more expensive daytime power consumption.

sludge is contaminated by industrial wastewater flows. At more and more wastewater treatment plants, sludge is digested in order to generate biogas, which is then used to generate energy, which can be used to heat buildings, power the wastewater treatment technology or sold to the electricity grid. As an additional advantage, both the overall volume and the organic content of the sludge are reduced substantially, lowering the cost of disposal.

- Smart water meters. These meters offer the option of distant reading, thus saving labour costs. These meters are discussed in detail below.
- Process optimisation. A lot of money can be saved by the more efficient operation of the existing infrastructure. Process optimisation does not entail investment in "heavy assets", such as water treatment facilities, pipelines, pumping stations and wastewater treatment plants. The focus is rather on smart technologies, including information technology, natural sciences and biotechnology, the application of which can result in lower infrastructure operation costs. Examples of process optimisation are given in Boxes 15 and 16, each showing how smart technologies can be used to save electricity.

Metering of consumption

The main purpose of measuring water consumption is to be in a position to issue invoices based on actual consumed amounts. The billing of consumption is both a fair system and one that provides proper incentives to conserve water.

Within the SEE region, the majority of houses and industrial and commercial facilities are equipped with water meters, although individual apartments inside large apartment blocks often do not have water meters, especially in the case of older buildings. The national penetration of water meters, calculated as the number of metered water connections divided by the total number of water connections, is therefore usually well below 100 percent. We have data only for Albania and Kosovo (as defined under UNSCR 1244), for which the rates are 40 percent and 83 percent respectively. The rest of the countries fall within a range between 40 percent and 90 percent.

As the lack of metering within apartment buildings is the single most important issue with regard to metering, we will devote the next subsection to this topic, before reviewing other metering reforms.

Metering of individual apartments

In buildings where individual apartments are not equipped with water meters, consumption is metered on the pipeline entering the building and the invoiced amount is passed on to individual apartments based on an algorithm (e.g. in proportion to the number of people living in each apartment, or the size of the apartment). This arrangement is convenient for the water utility in as much as it has only one customer, usually the association of residents, while the association itself

is responsible for collecting payments from the households. Nevertheless, there are buildings in which unmetered apartments pay their water bills directly to the water utility. In the absence of individual meters, households have no incentive to restrict their consumption, which results in above-average water use and thus higher revenues for the water utility.

However, the water utilities may also face serious problems as a result of the lack of apartment metering. Low-income households often prefer to consume less and therefore pay less, but absence of choice may lead to the non-payment of bills. In times of rising tariffs, residents of these apartments are particularly frustrated by their inability to control their water bills and are strongly opposed to tariff increases. They may be able to exert pressure on municipal decision makers to limit otherwise needed tariff increases.

Since water tariffs do not adequately influence the demand for water, excessive demand can also create difficulties for water systems with infrastructural bottlenecks or insufficient water sources. The provision of higher volumes of water and the collection of more wastewater also generate additional costs for the water company.

The pros and cons of apartment metering need to be assessed on a municipal basis as there is no uniform solution to this problem. In many cases, the best strategic option for the utility is the installation of meters, and this often coincides with

TABLE 17: **Reform — Installation of water meters in apartments**

Key stakeholders	Water utility, municipality, residents in apartment buildings
Main impacts	• Lower consumption of water
	• Reduced discharge of wastewater
	• Lower revenue for the water utility in the short term due to lower consumption
	• Lower variable costs due to reduced delivery of water and collection of wastewater
	• Better chances for the collection of bills
	• Easier implementation of future tariff increases
	• Improved customer satisfaction
Time needed	1 to 5 years, depending on the scale of the programme
Cost level	Between EUR 100 and 500/connection, depending on the layout of the pipelines in the building

BOX 17: **Metering in the United Kingdom**

In the United Kingdom, only about 30 percent of household water consumption is metered, which is a particularly low figure in Europe. Recently, the All-Party Parliamentary Water Group strongly recommended that the country move towards universal metering, as a means to improve the affordability of water services, to create a fairer system of charging based on variable, cubic-meter-based tariffs, and to help conserve water resources. (APPWG, 2008)

BOX 18: **Installing apartment meters in Pitesti, Romania**

One of the Romanian water utilities, Apa Canal Pitesti, started an experimental programme of apartment metering in 2004. The city of Pitesti has over 50,000 apartments in apartment blocks, only about 2,000 of which were individually metered before 2004. The water utility financed half the costs of water meters and their installation in 800 apartments. The remaining costs were covered by the residents of these apartments. Total costs came to about EUR 130,000. Water use by the participating households dropped, on average, from 130 m^3/year to 100 m^3/year after the installation of the meters, resulting in a proportionate decline in water and wastewater bills. (Morris et al., 2007a)

the interests of the residents. Nevertheless, execution is hindered by technical as well as legal and financial difficulties.

The main technical difficulty is that water pipelines run vertically in most apartment buildings, entering every apartment at least twice. Either several meters therefore need to be installed and then maintained and regularly read, or the internal water network needs to be redesigned, which is extremely costly.

The second issue is of a legal nature. The apartment blocks, and the water pipe system in the apartment blocks, are privately owned, either by the real estate agent or by the residents. Utilities only install water meters on utility-owned water pipes so as to have full control over the water meters. From a legal perspective, water meters owned by the utilities can thus often not be installed in apartment blocks. A way around this is for residents of the apartment block to pay for and install water meters for themselves to facilitate the fair distribution of water bills.

The other problem is that of paying for the work and the meters. In many cities, the residents of old apartment buildings are mainly low-income households who are not able to pay for the work themselves. The water utility and the municipality therefore have to come up with a financing scheme, which may include partial municipal or utility financing, loans to residents, and possibly applications for external funds from the state. Since consumption is likely to decrease after the meters are installed, a special scheme may involve partial financing of the meters from savings on water bills, in much the same way as the modernisation of street lighting is often financed from energy savings. In Albania, which in 2007 had a meter penetration of only 34 percent, the government sponsors municipal programmes for the installation of water meters, while households do not have to pay for the meters.

Other metering reforms

Besides installing new meters, the regular calibration, maintenance and replacement of existing meters are also important, since obsolete meters may err substantially. If the meters under-report consumption, the water utility will lose revenue; in the case of over measurement, customer satisfaction may wane. In most countries, regulation requires that water meters are calibrated periodically, usually every five years in the case of low-diameter household meters.

Lastly, some costs can be saved if meters are read less frequently. Traditionally,

BOX 19: **Switching to more precise meters in Karlovac**

In Karlovac, Croatia, old, large-diameter water meters measuring the consumption of whole apartment buildings are assumed to under-report low water flows in off-peak hours, such as during the night and during the day on weekdays. Total consumption in these buildings may therefore be under-measured by a few percent. To remedy this problem, the water utility of Karlovac started to replace these old meters with modern meters that have a special, low-diameter bypass that automatically switches on during low flows, therefore properly capturing all consumption.

meters have been read every month or every two months. Meter reading may also serve as an opportunity for collecting payments in cash, although this method of payment is becoming less and less frequent. Recently, however, more and more utilities are choosing to read household meters only once or twice a year, while continuing to read large consumers' meters between six and 12 times a year. Less frequent meter reading makes it possible to reduce personnel costs, while invoices are still issued monthly or bi-monthly based on estimated consumption and invoiced amounts are adjusted after the next reading of the meter. If a consumer believes that, in comparison to previous periods, their consumption has changed substantially (up or down), they can request an adjustment in the value of the invoices.

Development of information systems

Good-quality data are indispensable in order to assess the current operational, technical and financial performance and to make accurate decisions on these aspects. Most water companies in the region, however, have not yet transformed old methods of data collection and management into modern information systems, and available data are likely to be incomplete and unreliable. Developing and/or improving the information systems of water companies will boost the quality of status quo operations and decisions and will help to measure the achievement of goals.

Information systems, either manual or electronic, typically have three purposes:

- Functional support to business processes and operations: This involves the collecting, recording, storing and basic processing of data.
- Decision support: This involves the use and transformation of collected data for the provision of information in the decision-making process, including reports (profit and loss statements, list of non-paying customers etc.). It could also include management information reports with performance monitoring data to discuss performance improvement measures.
- Performance monitoring role: The processing of key performance indicators (KPIs) with the use of management information systems to allow performance monitoring, benchmarking and audits. These tools aid in performance improvement.

The following information systems are crucial for the proper operation of water utilities.

TABLE 18: **Introduction of new, or development of existing, corporate information systems**

Key stakeholders	Water utility management and departments
Main impacts	• More accurate and up-to-date data about the operations of the utility
	• Improved quality of decision making
Time needed	A few weeks to a few months per system
Cost level	Low to medium. Includes the cost of the system, consultation and training. Simple systems may cost a few thousand euros, while more sophisticated systems sold by multinational corporations may cost tens of thousands of euros

Financial information systems, which can be more complex and more informative than the simple bookkeeping required by regulation. Typically, these systems include tools for ordinary bookkeeping and financial reporting, cash-flow planning and accounting options. For example, cost centre accounting helps to identify costs as well as revenues by activity (e.g. water, wastewater, other fields of operation), which is important for tracking the financial performance of the branches and essential in designing cost-recovering tariffs (see Chapter 4 on tariff reforms). At present, however, many multi-service municipal companies do not have activity-based financial books, and it is difficult to know which activities make a loss or create a profit. It is suspected that in many Serbian cities the collection of parking fees and the management of cemeteries subsidise other activities, especially water services and district heating. (Dax, 2008)

Asset management systems, which list and value all existing assets for financial, maintenance, production and administrative purposes. In the event that some assets are not kept on the books of the water utility but are held by the municipality or the state, the utility should attempt to get a regular update on the status of these assets and their gross and net values, while also estimating the replacement cost of the assets (which is usually not the same as the book value). When connected to a financial information system and geographical information system (GIS), it can even aid in future investment planning.

Related to this is the implementation of a **geographical information system** on the water and wastewater networks. This is a useful tool for the operation and maintenance of the system, including tasks such as detecting water losses, investigating the condition of the network, spotting illegal connections and doing emergency repairs.

Customer relations management (CRM) with good-quality data on customers, consumption, billing and invoice payment, linked to the financial information systems, is vital to support the timely and effective collection of revenues (see Chapter 4 on tariff reforms).

A **database on employees** can play an important role in successful human resources management (see discussion of human resources management above) and can be linked to the payroll application of the financial information system.

TABLE 19: **Reform — Participation in benchmarking cooperation**

Key stakeholders	Water utilities, sometimes regulatory bodies
Main impacts	• Better understanding of areas of underperformance and the related reasons
	• Realistic performance goals
	• Monitoring of the achievement of goals
Time needed	1 year, but it can also be done on a continuous basis
Cost level	Low. Joining an ongoing programme such as IBNET requires only some internal time. Setting up a benchmarking programme with other utilities may require between EUR 1,000 and 3,000/year/utility, depending on the scope

Benchmarking

Benchmarking is the process of comparing various aspects of performance across several organisations, with the aim of determining relative performance positions, identifying best practices, and learning from others in order to improve performance.

Over the last 10 years, benchmarking collaborations have become widespread in the water utility sector, both domestically and internationally. Some of the benchmarking schemes are launched by the regulators in order to generate data for the process of tariff setting, to set service standards, and to devise sectoral policies (e.g. the UK, the Netherlands, and also recently Kosovo [as defined under UNSCR 1244][11]), but more often the associations of water utilities or the companies themselves initiate the cooperation.

The typical benchmarking methodology comprises the following steps:

- Decide on areas of investigation (e.g. water service, wastewater service, financial performance)
- Identify partners
- Determine data sources and data to be collected
- Collect, verify and correct data
- Compute performance indicators
- Determine relative performance positions and the underlying reasons
- Establish performance targets
- Decide on and implement measures to attain the targets
- Start again

Although one-off benchmarking cooperation exists, particularly for specific niche areas, most water utility benchmarking collaboration is carried out on a continuous basis, usually following an annual cycle. Multi-year benchmarking programmes not only feed strategic planning but are also useful in monitoring the achievement of performance targets.

BOX 20: **The Albanian water utility benchmarking programme**

With assistance from the World Bank, the Albanian Government started a water utility benchmarking programme in 2005. The programme is managed by the Performance Monitoring and Benchmarking Unit of the General Directorate of Water Supply and Sewage at the Ministry of Public Works, Transport and Telecommunications. The unit employs three professionals who collect, analyse and process monthly data from the water and wastewater utilities, make site visits to the companies and conduct training programmes on data collection. The staff also prepare performance reports on the utilities and the sector as a whole. Based on the results of the benchmarking exercise, performance objectives are set for the companies, and the allocation of operating subsidies and investment grants from the government is partly based on progress made towards achieving these objectives. This is not only a good use of benchmarking but also a motivation for water utilities to participate in the programme. At present, 54 water utilities take part in the programme, serving 78 percent of the population of Albania.

The value of some benchmarking indicators is influenced by the internal efficiency of the company as much as by its operating conditions. To take an example, a low value for the unit electricity use of the water service (kWh/m^3) may reflect a well-maintained network and highly efficient pumps, but it may also be the result of favourable operating conditions, such as a flat terrain, large customers, and a concentrated service area. The comparison of performance indicators among companies therefore needs to be done cautiously, with careful consideration of the differences in operating conditions. If the number of participants in the benchmarking cooperation is high enough, it may also be worthwhile computing indicator values for groups of companies on the basis of operating conditions or size. This is exactly what has been done by the Benchmarking Club of the Hungarian Waterworks Association (see Box 22).

Independent performance audits

As opposed to the audit of financial statements — which, in most countries, is a regulatory requirement that is supposed to validate the accuracy and trustworthiness of a company's finances — the purpose of a performance audit is to make recommendations on how to improve performance, based on prior assessment of the operations. Subjects of performance audits can be wide-ranging, including government entities, businesses, NGOs, processes, programmes and projects.

Ideally, performance audits are carried out by independent experts, that is, management consultants, who have experience in other similar organisations — in this case in other water and wastewater utilities — who are able to bring a fresh perspective and do not have an interest in maintaining ongoing practices. A performance audit can be requested by the regulator, the owner, or the management of the company itself, in search of ways to improve. Sometimes IFIs require that a borrowing entity goes through a performance audit and adopts specific recommendations contributing to better performance.

While a performance audit is not solely financial in its nature, it can have an important financial component. The auditors, while assessing the performance of the

BOX 21: **Water utility benchmarking on five continents: The IBNET**

The World Bank launched the water utility benchmarking programme, the International Benchmarking Network for Water and Sanitation Utilities (IBNET), in the late 1990s. The IBNET experts developed a data survey methodology and a set of indicators covering all the main aspects of operation, and set up a website (www.ib-net.org) with detailed information in English, Spanish and Russian. If a company chooses to participate in IBNET, it has to fill in the survey and submit it to the IBNET experts. Once the data are verified and inserted into the database, the participating company can generate benchmarking reports through the website and can compare its performance to other utilities, both within its own country and abroad. As of October 2008, the IBNET database contains data from more than 2,000 utilities from 85 countries.

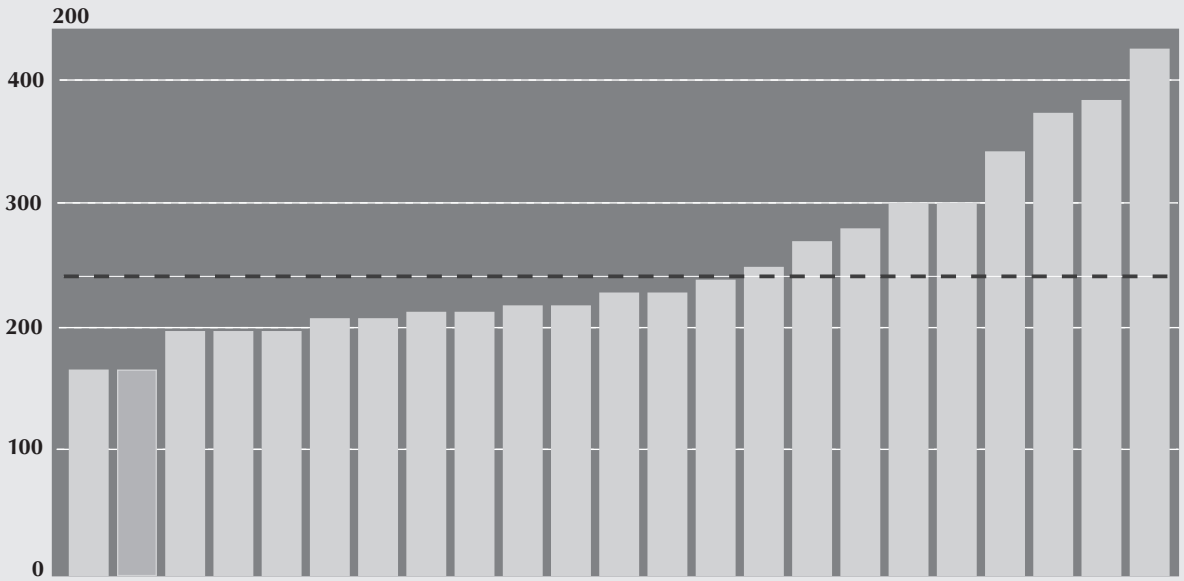
BOX 22: **The Benchmarking Club of the Hungarian Waterworks Association**

The Hungarian Waterworks Association launched its Benchmarking Club in 2007. Membership in the club is optional to member utilities of the association. At present, 23 companies are members of the club, covering 60 percent of water and 30 percent of wastewater services in Hungary. The club hired independent experts to design the benchmarking methodology, collect and verify data from the companies, and generate results tailored to each utility. Individual company data are kept confidential, but members can easily identify their relative performance through the use of diagrams that contain all indicator values anonymously, while the company's own indicator is coloured. The average value is marked by a horizontal line. An example of such a chart is given in Figure 3.

company, would also be looking at the various cost items and would point out where there is room for cost reduction. Some of the assessment, however, would be more technical than financial, looking at sub-operations (such as maintenance, customer service) and technologies (e.g. drinking-water treatment). Even procedures, such as the method of tariff setting, can be audited.

If the management of a company is open to learning from others, then best practice or process benchmarking programmes can be just as good, and sometimes even better than, independent performance assessment. Participation in benchmarking programmes usually requires less money but more time and attention on the part of the management.

FIGURE 3: **Unit operating cost of water service (HUF/m³)**



Source: Benchmarking Club of the Hungarian Waterworks Association

One of the goals of the club is to increase its membership, since a large sample size would make it possible to statistically analyse the relationship between indicator values and operating conditions.

TABLE 20: **Assessment of utility by independent experts and provision of advice on reforms**

Key stakeholders	Water utility management, independent experts
Main impacts	• Unbiased assessment
	• Better understanding of problems and possible solutions within the utility
	• Eventually improved operations, lower costs, higher revenues
Time needed	A few weeks to a few months
Cost level	Low to medium. Experts generally cost between EUR 200 and 1,000 per expert day, plus expenses

Chapter 4
Tariff reforms and improved revenue generation

The financial difficulties of companies, strictly from a cash-flow perspective, can be eased in two major ways: by cutting costs, and by generating more revenue. Strategies and measures to reduce costs have already been discussed in Chapter 3. The present chapter is devoted to enhanced revenue generation. First we will describe the current situation concerning revenues. Then we will present reform strategies to enhance revenues, including new tariff designs, setting cost-recovering tariffs, and the more effective collection of bills. We will also touch upon ways to ease the burden of higher tariffs on poor households.

Current conditions

There are numerous explanations for the insufficient revenues of the water utilities in the region:

- Some water consumption and wastewater release is not measured and therefore not paid for.
- Water and wastewater tariffs are low — that is, below cost-recovering levels.
- Utilities face difficulties collecting billed tariffs.

These issues are discussed in greater detail below.

While illegal connections seem to be a significant problem throughout the region, understandably there are no data on their actual extent. In some locations, the connection itself is not illegal but it is never billed due to poorly managed records and invoicing systems. The scale of such consumption is estimated at about 6.5 percent in Montenegro. Obsolete water meters also tend to under-meter real water flows. The reliability of water meters is considered to be good in Croatia and Albania, while we received mixed information from the rest of the countries in SEE.

TABLE 21: **Redesign of tariffs, changes to tariff structure and level, and improved bill collection**

Key stakeholders	Water utility, municipality, regulators, customers
Main impacts	The impacts depend on the suite of changes that take place, but most often the following changes can be expected in the case of successful implementation:
	• Higher revenues
	• Smoother cash flow
	• Increased burden falling on some customers, while the burden on other customers may not change or may even ease
	• Lower water consumption and wastewater discharge, and therefore reduced operating costs
Time needed	The tariff reform can be implemented within a year, but changes in the tariff levels may take longer if gradual increase is chosen
Cost level	Relatively low: requires staff time and possibly external consultants

The degree to which water and wastewater tariffs cover operating expenditures varies among the countries, and among the utilities within the countries. The situation is summarised in Table 22 and statistical data are provided in Table 1. The coverage of investment costs is obviously even worse than that of operating costs.

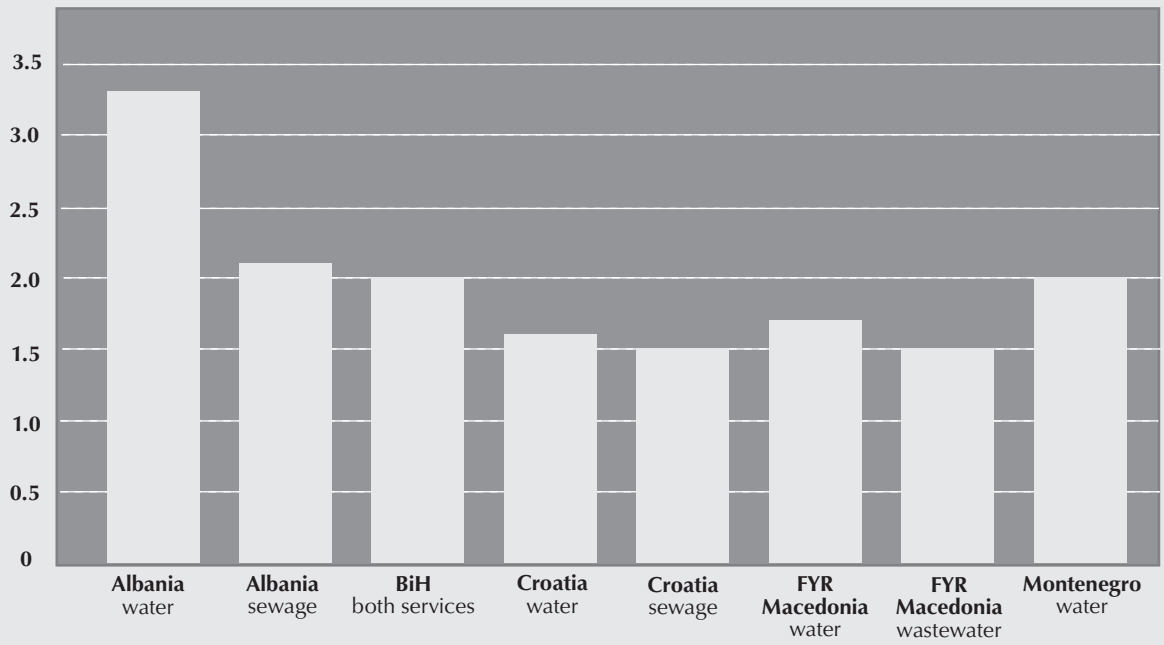
Even though the average tariff set by a water utility in the region in general is not sufficiently high, often different types of tariffs also differ in their level of cost recovery. Commercial or industrial tariffs are frequently higher than household tariffs, even if this difference is not justified by differences in the cost of serving commercial versus household customers. The justification is political or social: policy makers are more willing to burden enterprises, as they are perceived to be able to afford higher prices than households, while they also do not (directly) take part in political elections. In Figure 4 we summarise the available data on the ratio of commercial to household tariffs. Data for Kosovo (as defined under UNSCR 1244) and Serbia are not available, but cross-financing exists in most Serbian municipalities.

While acknowledging the reasons for higher commercial tariffs, we must also emphasise that cross-financing has its dangers. Low household tariffs do not provide an incentive to conserve water, which is a problem particularly when it is ex-

TABLE 22: **Level of cost recovery in the countries of SEE**

COUNTRY	LEVEL OF COST RECOVERY
Albania	Only a handful of utilities have high enough tariffs to recover operating costs. Utilities receive an operating subsidy from the government, but the subsidy scheme is to be phased out by 2012. However, full transfer of the predetermined subsidy is conditional on improvements in performance, as measured by some of the indicators computed as part of the benchmarking programme: utilities need to reduce water losses, increase collection of bills, and reduce costs in order to be eligible for the whole of the subsidy.
Bosnia and Herzegovina	The level of cost recovery varies among the utilities, but in most cases it is insufficient, i.e. operating costs are not covered by revenues from tariffs. The government provides a total of about KM 30 million/year in operating subsidy to the sector.
Croatia	Recovery of operating costs is common in medium-sized and large towns. Depreciation, however, is usually not covered from tariff revenues. Water and wastewater services in many municipal companies are cross-financed by other activities.
Kosovo (as defined under UNSCR 1244)	Operating costs are barely covered by revenues: the budget situation in the water utilities is very tight.
FYR Macedonia	Operating costs are rarely covered by revenues from tariffs. Tariff setting is guided more by political ambitions than financial rationale and the desire for financial sustainability.
Montenegro	Operating costs are usually not covered by revenues from tariffs. Government and municipal subsidies make up the balance.
Serbia	Water tariffs are decided at the municipal level and are subject to political considerations. As a result, they are usually not sufficient to cover operational costs. Moreover, since 2005 the central government has limited the tariff increase to the rate of inflation, therefore previously insufficient tariffs are anchored to continued insufficiency. Lastly, public utility companies typically carry out several services (e.g. water, waste, park maintenance), while the books are kept together without cost-centre accounting. It is therefore difficult to know the exact level of cost recovery.

FIGURE 4: **The level of cross-financing between commercial and household customers**



Source: Calculated by the authors based on the IBNET database

pensive to supply drinking water and when the capacity of water resources is limited. High tariffs lower the competitiveness of local industry, especially industry using a lot of drinking water during production, and this may eventually result in lower production, lower tax revenues, and increased unemployment among the local population. Large industrial customers may also seek alternative sources of supply, drilling their own wells and cleaning the water for their own use, ultimately considerably reducing the revenues of the water utility.

Cross-financing between water and wastewater services is also common, although its direction varies. Municipal companies sometimes channel money from other, profit-making activities (e.g. real estate, solid waste management) to water and wastewater services. When a water utility serves several settlements, such as a town and the surrounding villages, or sometimes a whole region, and the individual cost of serving them differs, then a uniform tariff in the whole service area also translates in practice to cross-financing. This practice is sometimes maintained due to social considerations[12], and sometimes due to lack of location-specific cost data on which to base cost-reflecting site-specific tariffs (WWRO, 2007b).

Not only are tariffs not set high enough to ensure cost recovery, there are also serious problems in collecting payments, as detailed in Table 23.

TABLE 23: **Current practice of collecting water and wastewater payments**

COUNTRY	ESTIMATED NATIONAL AVERAGE LEVEL OF PAYMENT COLLECTION
Albania	73%
Bosnia and Herzegovina	70%
Croatia	Not available
Kosovo (as defined under UNSCR 1244)	The average figure was 57% in 2006, but lower for households (around 48%) and higher for industry. The collection ratio of individual utilities ranges between 45% and 67%
FYR Macedonia	A survey by the World Bank arrived at a collection ratio of 50% to 60%, while a household survey covering 10 cities showed a figure of 75% (as stated by households). The individual values of municipalities range between 52% and 90%, and households seem to pay bills better than industrial customers. Collection of payments has improved lately, due to more stringent efforts such as warnings to non-paying customers, court processes, and disconnection from the network
Montenegro	60% to 75%
Serbia	Not available

Note: We have tried to ensure that the figures for unpaid bills are based on the same definition in all countries, i.e. that they represent the ratio of bills never paid, while late payments are not included. However, in some countries there has been ambiguity concerning the actual meaning of this indicator, so we are not certain about the consistency and comparability of these figures.

The sequence of tariff reforms

Major changes in water and wastewater tariffs may drastically influence the level of consumption (and therefore costs), the revenue stream and customer satisfaction with the services. It is therefore worth undergoing a rigorous design process and investigating, discussing and consulting on a number of questions before decisions on tariff structure and levels are made. In this section, a suggested list of such inquiries is provided in detail.

Throughout the design process a number of general principles should be kept in mind. Building on the recommendations of an EU DABLAS Task Force[13] document (2006), the following list is of essence:

- Tariffs should be relatively simple and easy to understand.
- Tariffs should produce revenues that are sufficient to cover service costs in a steady fashion. It should be borne in mind that there are several levels of costs, from basic operation through renewal of existing infrastructure to resource and environmental costs.
- Tariffs should reflect the different costs of serving different customer groups.
- Tariffs are not only a revenue instrument, they also provide a price signal, which is a straightforward means of protecting water resources.
- Affordability constraints of particular customer groups should be considered during the process.

The objectives of the reform

Changes in tariffs may be guided by a number of different goals, and the exact set of goals is probably the first issue to clarify. Possible goals are:

- Revenue generation. This is, of course, the foremost reason for the existence of tariffs. It makes sense to lay out a realistic, multi-year plan of revenue needs and alternative sources of revenues (grants, subsidies, income from non-core activities), and to determine the amount that is to be covered through revenues from tariffs. It is crucial to consider not only operating costs during this process, but also those capital costs (depreciation, amortisation, investment funds) of both the existing and planned future infrastructure that will be directly paid for by the water utility.
- Equity through cost-based tariffs. Even when tariffs altogether generate sufficient revenues to cover costs, cross-financing among different customer groups may still take place — in fact, this is often the case, as discussed in Chapter 3. When planning for the longer term, it is essential that decision makers determine the acceptable extent of cross-financing. From the perspective of economic efficiency, all customers should pay the full cost of the services they receive, which is an argument in support of phasing out cross-financing. This is also promoted by some IFIs, and even insisted on by those providing financing. However, other considerations are also at play, such as affordability and willingness to pay, and decision makers need to strike a balance between them. Cross-financing may be phased out or decreased gradually, over a number of years.
- Assistance to low-income households. Payment for water and wastewater services by low-income households can be eased in a number of ways (see discussion on affordability below), properly tailored tariffs being one of them. If households receive the first few cubic metres of water at a low price, while paying more for subsequent consumption — known as an increasing block tariff — then low-income families can afford water that satisfies basic needs, while more affluent families will generate more revenue at a higher average tariff. This type of tariff regime is in contradiction to the notion of equity introduced in the previous paragraph, although this is typical in designing tariffs: several, sometimes conflicting, goals need to be harmonised in the best possible way.
- Demand management. The most effective tool for demand management is the price of the service. Customers respond to higher tariffs by reducing their consumption, assuming that there is a correlation between their consumption and their water bills — that is, that they are individually metered. In the case of customers with both water and wastewater connections, it is the sum of the two tariffs that must be considered. Demand management is most desirable when the operating cost of serving water is high, when there are technical bottlenecks in the infrastructure, or when the capacity of the water sources used by the utility are limited, even if the last of these is only a seasonal phenomenon.

- Long-term revenue stability. We have seen cases in the region where large industrial customers were considering abandoning the water utility and switching to self-supply because they did not want to continue the large-scale cross-financing of other customers. If there is such a risk, the utility may consider engaging in a long-term contract with its biggest customers, possibly including a schedule of reduced or non-raised tariffs. Such a contract would eliminate a serious risk for both parties: for the utility the risk that service use would suddenly drop; and for the industrial facility the risk of continued future increases in water tariffs.
- Pollution reduction. This mostly applies to industrial facilities discharging polluted wastewater into the sewer, which makes it more difficult/costly for the utilities to treat wastewater, and they may be subject to fines or effluent charges by the government. The water utility may impose a special wastewater charge that reflects its additional burden originating from the effluents.

Clarifying the goals of the tariff reform, and then designing the tariff regimes based on these goals, is of special significance because regulators (whether local or national) may otherwise be inclined to make ad hoc tariff decisions based on short-term influences.

Tariff designs

As opposed to simple annual adjustments in the price of the water and sewerage services, tariff reforms are more fundamental in nature, as they may also change the structure of the tariffs. In this section we introduce the main categories of tariff designs together with their advantages and disadvantages. It should be noted that — with the exception of a flat monthly tariff — all these designs require that the consumption of the individual client is metered. During the development of new tariff designs, attempts should be made to keep a good balance between simplicity, understandability, ease of administration, revenue generation and economic efficiency. While this is by no means easy, fortunately there is a good choice of different tariff designs to work with.

Flat monthly tariff

Under this scheme, customers pay a flat rate per month, regardless of their actual consumption. The rate may be equal for all households, or it may vary according to a particular criterion, such as number of residents or number of rooms. This is really the only type of tariff that can be applied for unmetered households, and it is almost never used for metered locations.

Example: EUR 10/month/connection

Advantage:

- Water meters are not required

Disadvantages:

- Lack of incentive to conserve water

- Customers cannot influence their water bills
- Tariff increases meet higher resistance than under most other tariff designs

Simple variable tariff

Customers pay a uniform tariff after each cubic metre of water consumed. This scheme is often referred to as volumetric charge. The wastewater tariff is typically also set as a variable tariff, and released wastewater is calculated as a certain percentage of water consumption — in most cases 100 percent but sometimes less, assuming that part of the water is used outside the building, for example to water the garden or wash the car.

Example: EUR 0.8/m^3

Advantages:

- The variable tariff serves as an incentive to conserve water
- Customers can react to changes in price

Two-part tariff

The two-part tariff is the combination of the flat monthly tariff and the variable tariff. While customers have to pay after each cubic metre of consumption, they are also subject to a flat monthly fee. However, this is not equivalent to paying for the same service twice. The flat tariff usually makes up a relatively low proportion of the total bill (up to 20 or 30 percent[14]) and it also makes it possible to apply a somewhat lower variable tariff than would be the case under a simple variable tariff system.

Example: EUR 3/month/connection + EUR 0.6/m^3

The main justification for the two-part tariff scheme is that the majority of the costs of water utilities are fixed costs, that is, costs that are not proportionate to consumption, and these costs should be covered, as far as possible, independently of the actual volume of water consumed and sewage discharged. The fixed costs of water systems (depreciation, IT, maintenance, repairs, meter reading, billing etc.) do indeed make up between 60 percent and 80 percent of all costs[15]. In practice, however, the fixed tariff component usually generates less than one-third of all tariff revenues, because having a larger fixed tariff would place too great a burden on small consumers. It would also reduce the incentive to save water, since a larger fixed tariff would also translate into a smaller variable tariff — since less revenue would have to be generated from variable tariffs — thus the incentive effect of the variable tariff would be scaled back.

Policy makers in some SEE countries (Albania, Croatia, Kosovo [as defined under UNSCR 1244]) made it possible for water utilities to introduce two-part tariffs. Nevertheless, this practice is not widely established. We are aware of only one case, the Karlovac utility in Croatia, which pioneered the introduction of this tariff regime in 2007, while others may follow suit. In Hungary, a growing number of utilities every year use the two-part tariff regime, and this tariff system is widely

applied in high-income countries. Two-part tariffs are relatively new in the water sectors of CEE countries, but they have been in existence in other service sectors, especially in telecommunications, for many years.

Advantages:

- The fixed component of the tariff helps smooth revenue levels throughout the year. This is valuable in places with variable seasonal consumption, for example in tourist areas where peak consumption takes place during the summer.
- This is a fairly equitable tariff design since generated revenues are quite close to corresponding service costs (at least if tariffs have been set at cost-recovering levels).

Disadvantages:

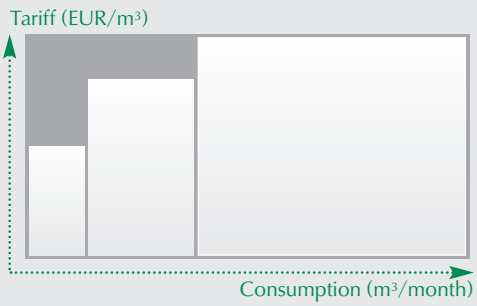
- The fixed tariff component may place a heavy burden on low-income households. This can be mitigated by providing a few cubic metres of "free" water use in exchange for the fixed tariff component.
- The introduction of a two-part tariff requires extensive communication with customers, so that they understand and accept the rationale for it.

Block tariffs

Under a block tariff scheme the variable tariff changes according to consumption. Predefined blocks of consumption have different prices, and the actual price charged to a customer depends on the consumption block into which they fall. There are both increasing and decreasing block tariff designs.

Under an increasing block tariff design (Figure 5), initial consumption, for example up to 5 m^3/month, is billed at a lower price, while subsequent consumption is charged at a higher tariff. There may be two or more blocks. The tariff within the first block is usually below the true cost of supply, and this low tariff is justified by the need to supply some water to low-income households at a low price. Medium and high-income households, which can afford to buy more water, will also pay more for it on average, since some of their consumption will fall into higher categories of tariffs. Since families with high consumption pay more per cubic metre of water than families with low consumption, they in fact cross-finance the water use of low-income households.

FIGURE 5: **Increasing block tariff design**

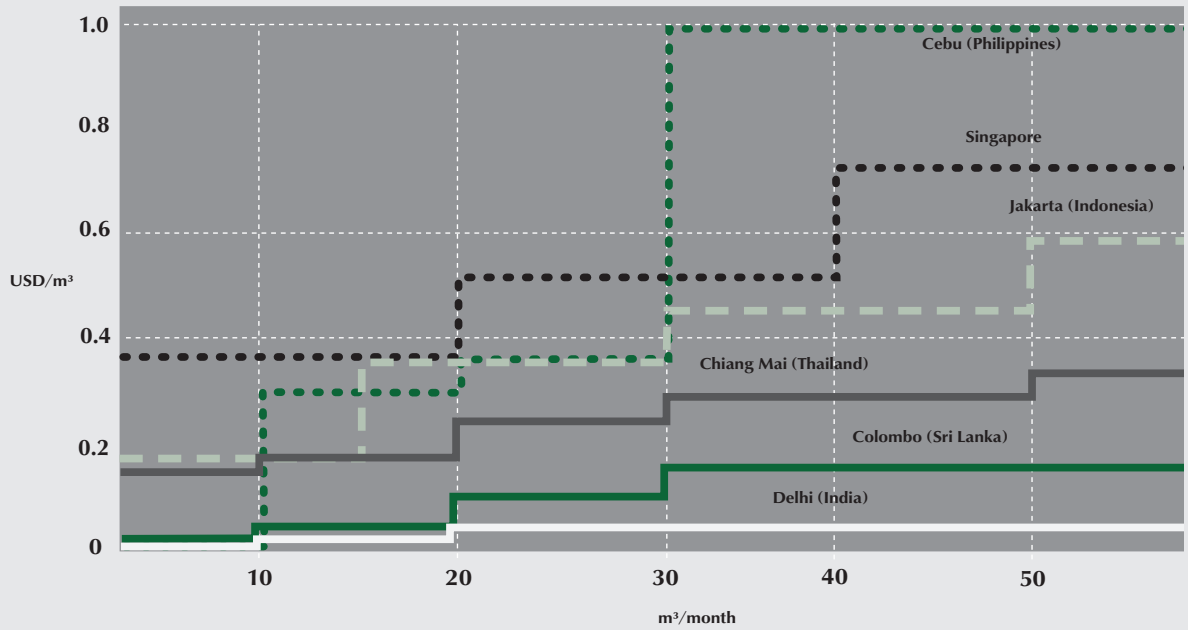


We are not aware of the application of increasing block tariffs in Central Europe[16], although there are plenty of cases from the developing world, some of which are illustrated in Figure 6.

Advantages of increasing block tariffs:

- Low-income households have access to some water at a low price, in line with their ability to pay.
- This tariff scheme is cheaper to administer than social water tariffs, in which low-income households need to be identified and separately handled.

FIGURE 6: **Examples of increasing block tariffs from South East Asia**



Source: Whittington (2001)

Disadvantages of increasing block tariffs:

- Cross-financing takes place among customers, which provides bad price signals and reduces the economic efficiency of the drinking-water "market".
- Experience of operating increasing block tariff schemes suggests that stakeholder groups constantly try to enlarge the size of the first block to cover higher monthly consumption. Too large a first block, however, would distort the effectiveness of this tariff system.
- In the case of shared connections, that is, when several, typically low-income households are on one connection (common in some low-income countries), consumption falls into a higher tariff category and the original social purpose of the tariff is therefore not fulfilled.
- If the blocks are optimally defined, increasing block tariffs can be effective in reaching social as well as water conservation goals, although ill-defined blocks can cause substantial economic damage.
- Large families, which often have a lower relative purchasing power, are subsidising smaller families that consume less on average.

Under a decreasing block tariff design (Figure 7), initial consumption, for example the first 5 m^3/month, is billed at a higher price, while subsequent consumption is charged at a lower tariff, and the number of blocks may be two or more. The tariff within the first block is meant to capture some of the fixed costs associated with water supply, therefore this tariff scheme is somewhat similar to a two-part tariff design, consisting of a fixed and a variable component, as discussed above. However, there is a substantial difference: the decreasing block tariff may have a block with a very low tariff at high levels of consumption, providing cheap water to large consumers such as industrial facilities, manifesting economies of scale in the price of water. It should be noted that this is rational only when the water system has abundant water supply at low costs.

Advantages of decreasing block tariffs:

- The high price of the first block stabilises revenues for the water system and makes it easier to cover fixed operating costs. This is especially useful in areas with a lot of small consumers, such as weekend houses.
- Economies of scale, that is, lower average costs for serving large customers, are reflected by the tariff design.

Disadvantages of decreasing block tariffs:

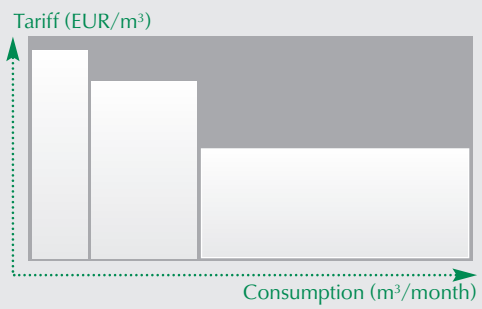
- This system places a heavy burden on low-income households, which may need to be compensated in some other form.
- Large customers do not have an incentive to conserve water.
- The system only works if meters are read in every billing period (monthly).

Special surcharges

When it comes to charging for the delivery of water and collection of wastewater, the water utility has many choices, as illustrated in the following pages. However, the company can also charge for additional services, most commonly for the establishment of water and wastewater connections and the handling of particularly polluted sewage.

Making new connections requires resources on the part of the water utility in the form of labour, tools, materials etc., therefore it is reasonable that it also charges new customers for these costs. This practice is widespread in the EU and is becoming more conventional in the SEE region. Connecting customers along existing pipelines is less costly, while extending the network to new neighbourhoods and establishing connections there is more expensive. Depending on the financing of the new portion of the network, whether grant, loan, or the utility's own resources, the company may charge (much) more on new network sections. Before developing the network, the willingness of customers to pay for connection to the network needs to be estimated and considered.

FIGURE 7: **Decreasing block tariff design**



BOX 23: **The effluent treatment surcharge in Pitesti, Romania**

In August 2004, Apa Canal Pitesti (ACP), the water and wastewater service company of the city of Pitesti and neighbouring small settlements, introduced a surcharge on industrial pollution discharged into the sewer. The sewage is collected and treated by ACP, and the pollution content has an impact on the cost of treating the wastewater. The monitoring department of ACP takes regular samples of the discharged wastewater of the industrial facilities served by ACP. When the concentration of pollutants in the sample exceeds specified effluent standards, a surcharge is added to the regular wastewater tariff and all of the wastewater discharged during the period in question is subject to the surcharge. The surcharge itself is proportionate to the level of the above limit pollution load. In 2006, revenues from the surcharge made up 4.45 percent of all of the wastewater revenues paid by industrial facilities. If an industrial polluter plans to invest in wastewater pre-treatment facilities, ACP is willing to negotiate a temporary reduction in the surcharge during the construction phase. (Morris et al., 2007a)

The release of wastewater into the sewer is usually paid for by the cubic metre, based on metered water consumption, or on metered or estimated wastewater discharge. However, some industrial sewage contains effluents that will generate costs to the utility beyond the usual costs of wastewater collection and treatment. These costs may be related to the supplemental technological or resource needs for treating the industrial effluents, or special effluent charge payments to the government based on the release of pollutants into water bodies. Such additional costs can be passed on as a pollution charge to the industries emitting the effluents into the sewer. Ideally, this charge should be based on actual pollution loads, either measured continuously for heavily polluting industries; or estimated based on year-round sampling of sewage discharge for smaller facilities. Having a high enough pollution charge in place will provide an incentive for polluting industries to pre-treat their wastewater.

The question of affordability

As shown in Table 23 on page 68, the level of invoice collection is insufficient in most SEE countries. There are many reasons for this, the most common being that many low-income households cannot afford to pay their water and wastewater bills. As continuous tariff increases are envisioned for the coming years, the question of affordability may become even more important. On the other hand, any increase in the general income level of the population will be helpful in ensuring the payment of higher water bills.

There seems to be an internationally accepted principle that water and wastewater expenditures should not exceed 4.5 percent of household income (World Bank), including for the lowest 10 percent income bracket and pensioners.

Once it has been determined that the burden imposed by water and wastewater tariffs on low-income households is too high, several strategies can be applied to ease this burden. Some of these measures are specific to low-income households, while others are more general but will also help the poor.

- Large tariff increases should take place gradually, over an extended period of time — if this is feasible.

- Increasing block tariffs (as discussed above) provide relief to households with low consumption, since the average tariff they pay will be lower than the average tariff invoiced by the water utility in general. Low-income households can therefore enjoy a preferential water tariff, as long as they also cut back on their consumption. The tariff design itself would be universal across all customers: this is not something specifically tailored to the needs of low-income households.
- Lower than average social tariffs, which are made available exclusively to low-income households, will ease the burden on these customers, although their administration can become costly.
- The continued cross-financing of household tariffs from the revenues of higher commercial tariffs will limit the increase in households tariffs, although this practice has multiple drawbacks, as discussed above. While this is common practice at present, there are plans to scale it back. The regulatory authority of the water sector in Kosovo (as defined under UNSCR 1244), for example, declares that "domestic customers may suffer from affordability constraints not experienced by non-domestic customers". Therefore, in the short term, the practice of higher commercial and lower household tariffs may be retained, although tariffs should be equalised in the medium term, and cost-reflecting tariffs (i.e. higher tariffs for households and lower tariffs for water-intensive industry) should be targeted in the long term. (WWRO, 2007b)
- In some countries, state subsidies are given to locations where the cost of service is high due to unfavourable operating conditions such as a deep water base, poor raw water quality necessitating extensive treatment, or high elevations. This is the case in Hungary, where municipalities can apply for an annual subsidy that can be used to lower household tariffs but not commercial tariffs. However, this scheme also subsidises high-income families in the area.
- Social aid is general assistance that is not earmarked for water bills or any other specific purpose, but that increases the incomes of poor households. In general it has nothing to do with water services, but it may improve the payment of water bills by poor households. However, there are many competing claims on the incomes of low-income households, and in the absence of strict enforcement, social aid is likely to be spent on other things than water bills.
- Prolonging overly expensive investments will allow a delay in the raising of tariffs.
- The introduction of metering will make it possible for households to reduce their consumption in order to bring their water bills closer to affordable levels.
- An economically rational, although not widely applied, strategy is to provide a low-cost service to low-income households. This may take the form of shared taps in the yard or the street, or the delivery of bottled drinking water, but not tap water. Both methods ensure access to drinking water at a moderate cost, limiting the financial burden on both the water utility and the customers.

Lastly, it should be borne in mind that low income is not always the only reason for problems in invoice collection. While investigating the issue of affordability, other aspects of payment should also be considered, such as the strictness of enforcement and the ease of payment, as discussed above. Willingness to pay for water services may also depend on the perceived quality of the service and of the water itself.

Tariff modelling

When a number of major tariff changes are introduced simultaneously, it can be difficult to predict the overall results. Higher cubic metre–based tariffs will probably result in lower consumption in individually metered households, but are unlikely to influence the consumption of apartment buildings where individual apartments are not metered. Higher prices may also prompt a change in the bill collection ratio. When the installation of meters is part of the reform package, consumption and therefore revenues may decline, but at the same time more invoices may be paid on time. If less water is consumed, then operating costs will also be lower; and in the case of cost-recovering tariffs, lower costs will actually require lower tariffs than originally planned. These are just a few of the basic correlations at play. Tracking all of such correlations for multiple classes of consumer rapidly becomes a complicated exercise.

However, computer models can be extremely useful in making all these calculations for decision makers. Once a financial model of the water utility has been set up, it is easy to test variations of assumptions and to save scenario results and compare them against each other. Such models can be programmed, for instance, to calculate tariffs that will recover the future costs of the service while gradually decreasing existing cross-financing among customer categories, and also introducing a specific fixed monthly water tariff.

Needless to say, the usefulness of a model depends on the reliability of the data it uses. Making decisions based on the results of a model relying on poor data may do more harm than good. Water utilities' information systems are essential for many purposes, one of them being the proper modelling of tariff reforms. More information on tariff modelling is available on the link provided at the end of Box 24.

Implementation of tariff reforms

Once the tariff designs are selected and a tariff schedule is established, the new tariffs need to be put to work in practice. Administratively this is easy: it requires some changes in record keeping and in the billing software. Nevertheless, it makes a lot of sense to carry out other, accompanying measures so that affected customers will understand the reasons for the change in tariffs and be willing to accept the new tariffs.

Probably the most important element is good communication. Water utility tariff reforms in Central and Eastern Europe almost always lead to an increase in the average price of the services. If an explanation is given, customers will be more likely to consent to the increase. Many channels of communication can be used, including stakeholder meetings, newsletters, newspaper articles, broadcast inter-

BOX 24: **The ASTEC model**

One model that is available to interested water utilities free of charge is the ASTEC model developed by the UNDP/GEF Danube Regional Project. ASTEC (Accounts Simulation for Tariffs and Effluent Charges) is an Excel-based model capable of broadly examining the correlation between a water system's tariffs and its investment strategies, cost structures, customer behaviour and physical conditions, such as water production and wastewater collection. ASTEC has been implemented and used by several Central European water systems since its first version was released in 2004. One key application of ASTEC was to help water utilities prepare for major EU-supported investments by better understanding the financial implications, including expected changes in cash flows and tariffs.

While the ASTEC model itself is free, experience shows that using the model correctly and effectively requires a substantial commitment in terms of staff time, command of English, understanding of Excel and of basic finance or economics, and good-quality data about the operations of the company. The model and auxiliary materials can be downloaded from the following site:

http://www.undp-drp.org/drp/en/activities_1-6_-7_tariffs_and_charges_fr_phase2.html

views with the water utility management, and website information. It is imperative that people also understand the consequences of maintaining the status quo — that is, the type of problems that the water utility, and eventually the customers, would face without the higher tariffs[17]. The message is more effective if some of the improvements are already under way — if local residents see that construction has started, that meters are being replaced or that a previous bad smell has disappeared from the streets etc., they will probably be more open to price increases.

Implementing tariff reforms together with cost-saving reforms has at least two distinct advantages. If reforms aimed at saving costs are well communicated, this may, once again, improve the reputation of the company, since customers will think that the utility does not only want to collect more revenue but is also carrying out initiatives "on its own". Moreover, the reform process would have several stages. If the tariff reform does not work out as well as expected, at least costs will be saved: cost savings and somewhat higher revenues together may still ensure proper momentum to the reform plans of the company.

Part of the increase in tariffs may be dedicated to future investments, and therefore some of the revenues may be set aside for a longer period. This may have to be done in a special fund, possibly maintained by the municipality, otherwise the surplus revenue of the water utility may be subject to corporate income tax, depending on the national tax regulations. Collecting a "development fee" instead of just increasing the tariff may also be advantageous if such a fee is not subject to VAT, and therefore the increase in household tariffs is less dramatic.

After the tariff reform has been implemented, its actual performance should be closely monitored and, if necessary, adjustments should be carried out.

Improved revenue collection

The development and introduction of brilliant tariff reforms are of limited use if invoice collection problems persist, or even worsen. This section is devoted to

methods for improving revenue collection. We provide an "inventory" of potential measures, although their actual applicability depends on the national and local legal, institutional and cultural environment. Some measures will work fine in one country but are illegal or otherwise undesirable in another. In SEE, the current rate of collection of water and wastewater bills is about 70 percent (see Table 23 on page 75). If improved revenue collection measures are taken, utilities could improve revenue by 20 to 25 percent.

Proper invoicing and payment records

A prerequisite for any of the following methods of improving collection is accurate and up-to-date information about the status of invoices and payments. Tailor-made software is now available for this purpose at a relatively low cost: what is lacking in some companies is the determination to introduce new software and change some of the related working routines.

In some instances, the tasks of invoicing and collection are carried out by an external company rather than the water utility. Typically, there is a municipal company that specialises in billing and collecting invoices for all municipal services, including solid waste collection and district heating. Since these companies usually enjoy a local monopoly for such tasks, entrusted to them by the municipality, they lack the incentive to excel in what they do. Consequently, some of the water utilities receive only delayed and poor-quality data on the payments for their own services, making payment collection even harder. Since we are not talking here about the voluntary cooperation of commercial enterprises, but rather about a relationship driven by local political considerations and tradition, the water utility cannot simply terminate the contract with the billing company. Instead, it often needs to go through a long and tedious process of negotiation. Depending on the performance of this municipal department, it may still be worth the effort.

Stimulating payments

Traditionally, utilities follow a legal administrative collection improvement procedure in cases of non-payment. This includes one or more payment reminders, warnings and a penalty, often in the form of late payment interest. Unfortunately, the efficacy of these methods is questionable: most customers do not simply forget to pay but fail to do so as a result of financial hardship or unwillingness.

Debts that are difficult to collect can also be sold — at a steep discount — to debt collection enterprises. As dealing with these enterprises can prove cumbersome, merely learning that debts are being sold may prompt customers to pay bills. In some countries, however, this is not a legal option.

When a customer is willing to pay accumulated past invoices but is unable to do so in one go, the utility may agree on an amortised schedule of payment — for example 24 equal payments over a two-year period. Discounts may also be used as an incentive to pay past invoices, although water system managers are legitimately worried about sending the wrong signals to average customers: that the water util-

ity is not acting fairly, since it gives discounts to non-paying customers while those who pay on time receive no relief; and that it is unwise to pay on time since late payment will be rewarded by lower prices. Nevertheless, this could be an effective incentive when launching a one-time debt amortisation project with the condition that, after the financial reforms, customers adhere to the new, more stringent tariff and collection procedures.

Legal procedures

Normally, non-paying customers can be taken to court. Unfortunately, legal procedures in many CEE countries are very slow and reaching a verdict can take well over a year due to overburdened and understaffed courts. Under these circumstances, the legal option often becomes a last resort. However, for the water utility, winning a case will be worth far more than the value of the financial settlement — the utility will have demonstrated the effectiveness of the legal procedure and will thus be better able to persuade customers to start paying their old invoices.

Technical measures

The most widely used technical measure is to disconnect non-paying customers. The applicability of this measure depends on the regulations in force: this is a legal option in some countries but is prohibited in others due to concerns about its impact on public health. The REC survey of SEE countries shows that disconnection is not allowed by law in Albania and Bosnia and Herzegovina, while it is legal, although rarely applied with respect to households, in Croatia, the former Yugoslav Republic of Macedonia and Serbia. In some cases, the municipality does not allow disconnection even though it is an option from a legal point of view. Disconnecting individual apartments within apartment blocks is often not feasible technically, as the same pipeline runs through a number of apartments. In locations where disconnection is both permitted and technically possible, this is probably the most effective method of improving payments.

An alternative to disconnection is the installation of a low-pressure valve before the pipeline enters the customer's home in order to reduce water pressure. There will still be a continuous supply of water (satisfying public health requirements), but the convenience level of the service will drop, since water will barely flow from the taps.

Another method requires advanced technology, and therefore some investment, but in exchange it promises improvements in the company's cash flow. Smart meters and connected valves make it possible to introduce prepaid water services. The logic is the same as for prepaid telephone services: customers pay in advance then use their budget balance for water consumption. There are two main variations of this technique.

Water can be purchased via a prepaid plastic card or related payment device. Once the balance from the card is used up, the card must be recharged or a new one purchased. This method is widespread in developing countries with a partially de-

veloped water infrastructure, and is often implemented on street taps, for example in South Africa, Brazil and the Philippines.

Alternatively, water can be delivered to homes and a smart meter registers consumption and the related cost in real time, and transmits the data to the headquarters of the utility. Once the prepaid budget is used up, a centrally located software will instruct the meter to shut the valve. Customers can recharge their budgets and regain access to the water supply. This is a less widespread system, used mainly in some locations in the United States.

Lastly, the investigation of illegal water and wastewater connections will expand the customer base and therefore increase revenues. This again is a costly exercise that requires special equipment to be purchased or rented by the utility.

Chapter 5
Case studies

Case study 1
Reforms at the Karlovac utility, Croatia

Karlovac is a city of about 60,000 inhabitants, located about 40 kilometres to the west of Zagreb, the capital of Croatia. Between 2005 and 2007, the local water utility company, Vodovod i Kanalizacija d.o.o. (ViK Karlovac), was the subject of a demonstration project under the UNDP/GEF Danube Regional Project. The present chapter is based on the report of this undertaking (Morris and Kis, 2007b) as well as a personal interview with Mr. Kresimir Veble, the manager in charge of the ongoing ISPA project. (Veble, 2008)

Baseline situation

ViK Karlovac is a utility company owned by the Karlovac municipality, serving the city of Karlovac and its immediate surroundings. Karlovac has a favourable geographical location: four rivers cross the city boundaries and the water utility has access to high-quality groundwater from shallow wells at a low cost. Water is essentially delivered to all households, and the city has a well-established sewerage network. However, the quality of the network varies. Some sections were damaged during the war in the 1990s and regular maintenance has been neglected for extended periods. As a result, part of the water network has a high ratio of leakage, with overall unaccounted-for water being above 50 percent. There are also regular breaks in the sewers, due to its obsolete state. Collected wastewater is discharged into the rivers without treatment.

In recent years, ViK Karlovac has usually broken even financially as a result of a number of factors:

- The low cost of the water supply.
- The absence of wastewater treatment, which would otherwise be a costly activity.
- The financing of most investments, for both rehabilitation and new infrastructure, mainly from grants provided by the government and the Karlovac municipality[18], and partly from ViK Karlovac's own resources.
- The cutting of expenditure by delaying maintenance projects — in fact, the net financial balance is usually used for investment purposes in any given year, assuring a break-even position.
- The fact that commercial tariffs are roughly double household tariffs, thus industrial and commercial customers generate a higher share of revenues than their share of service use.

As ViK Karlovac intends to upgrade its operations, it will need more resources in the future and must therefore improve its financial situation. The utility would like to extend its networks, especially the sewerage network (10 km of new network and eight new pumping stations) and build an advanced wastewater treat-

ment plant, while spending more on proper maintenance and the replacement of the existing infrastructure. As a consequence, annual costs are projected to rise from about HRK 34 million in 2006 to close to HRK 60 million by 2011, despite the fact that the majority of the new investments will be financed by EU grants, with expected contributions from the Croatian Government as well. The substantial increase in annual costs is due to partial self-financing of the investments, through a loan from the EBRD; and increased operational costs, especially related to operating the wastewater treatment plant.

ViK Karlovac will be able to finance its increased level of expenditures only if it can generate more revenue while cutting its costs. We look at actual measures in some detail below. The figures are based on computer modelling of the reforms, using the ASTEC model (see Box 24 on page 78).

Cost reduction

ViK Karlovac has already implemented some cost-reducing reforms in recent years. The introduction of the SCADA system (see Box 15 on page 52) helps to shave off some of its electricity costs. Three years ago the utility started to outsource part of its maintenance and repair activities in order to lower costs. On the other hand, while it is clear that the company is overstaffed, the workforce has not been touched.

Since the level of unaccounted-for water is above 50 percent, reducing leakages would seem a good strategy to save costs. The impact of such measures was examined using the ASTEC model, and it was found that in the case of ViK Karlovac this is not a universally attractive strategy due to the low cost of providing drinking water — savings in operating costs would be lower than the associated investment costs. Nevertheless, there may be network sections where it makes financial sense to reduce leakage, thus a leakage reduction programme requires careful assessment of the costs and benefits on each main network segment.

Besides expanding the wastewater network within the service area of ViK Karlovac, a section of the network — the recently built South Collector — connects to the neighbouring community of Duga Resa, a smaller town than Karlovac and home to a few industrial operations. Duga Resa has its own water utility company, supplying drinking water and collecting sewage from the properties within the town. The collected sewage used to be dumped into the river, but it is now transferred to ViK Karlovac through the South Collector. At present, the wastewater from Duga Resa is not treated, but once the wastewater treatment plant is finished, ViK Karlovac will treat this sewage and charge the Duga Resa water utility for its treatment. This cooperation is viewed as logical from an economic as well as a technical perspective. The wastewater treatment plant is designed to have sufficient capacity to handle sewage from Duga Resa, and due to its size the unit cost is expected to be lower than if Karlovac and Duga Resa built separate plants.

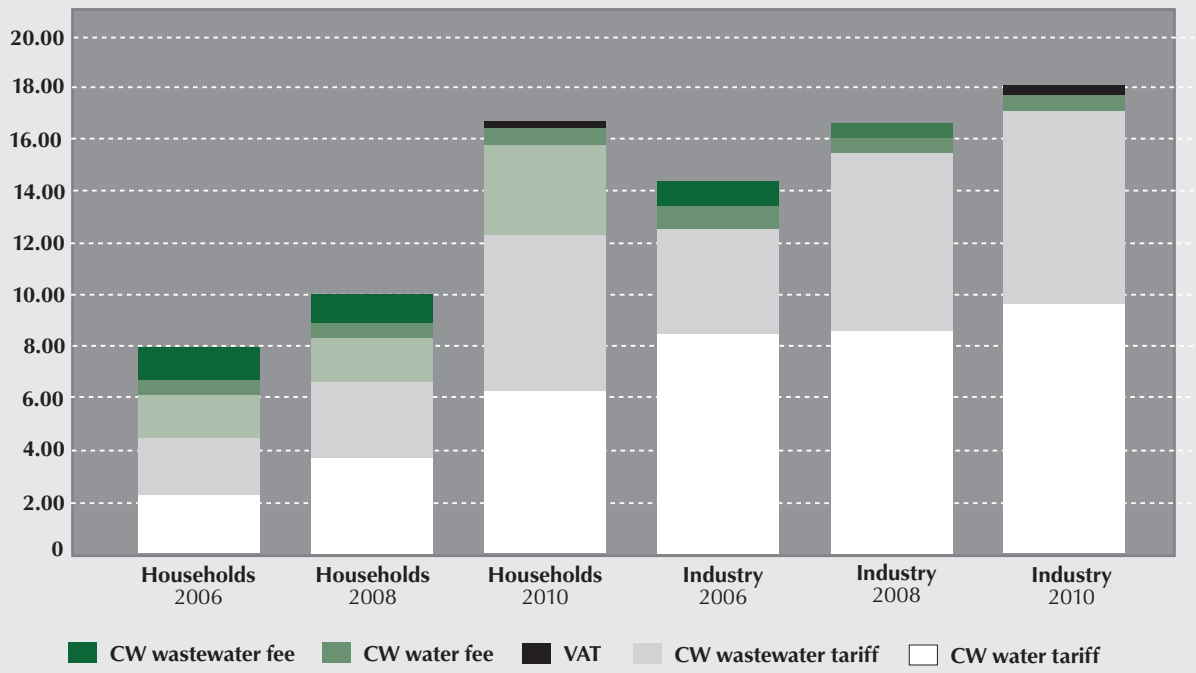
As a precursor to the EBRD loan, the EBRD and the Italian Government funded the Financial and Operational Performance Improvement Programme (FOPIP), a technical assistance programme to help the management of ViK Karlovac to improve services while reducing costs (SGI, 2008). The FOPIP contains a wide range of recommendations, covering topics such as managerial

accounting, revenue administration, tariff adjustments, strategic planning, benchmarking, control of leakage, internal organisational structure, customer service, the special handling of key customers, management information systems, corporate governance and human resources.

Tariff reforms

Even if the cost-saving potential at ViK Karlovac is fully utilised, tariffs will still have to be substantially increased, by about 60 percent on average, between 2006 and 2010. An established revenue target can be met through different combinations of tariff changes. In the case of Karlovac, a higher increase in wastewater tariffs would be justified in terms of cost recovery, since most of the additional costs are related to the sewerage service. The water service, however, has a higher revenue base, since more water is sold than wastewater collected (5 million as opposed to 3 million m^3/year). Since industrial water and wastewater tariffs are already much higher than household tariffs, future increases can be used to readjust this imbalance to some extent. In fact, one of the prerequisites of the EBRD loan is that the gap between industrial and household tariffs should fade, and even-

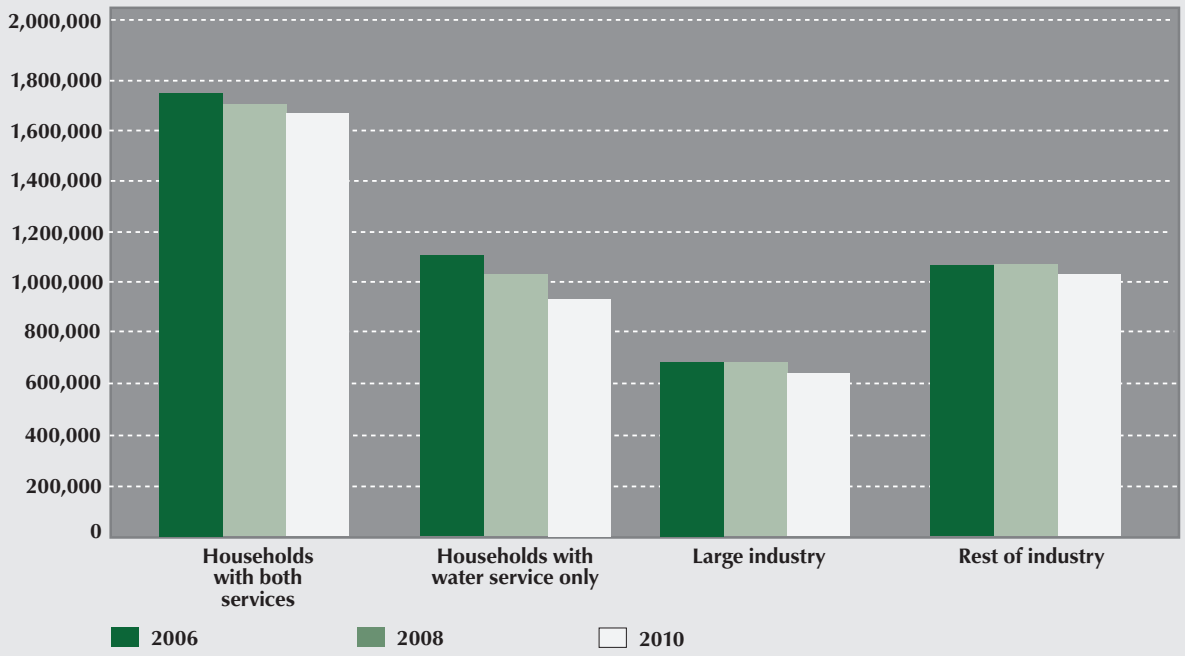
FIGURE 8: **Tariff levels in core modelling scenarios at ViK Karlovac**



Source: Morris and Kis (2007b).

CW: Croatia Waters, the state agency collecting water and wastewater fees. VAT for industry is omitted as industrial plants can deduct the water and wastewater service VAT from their expenditures

FIGURE 9: **Water consumption levels in core modelling scenarios at ViK Karlovac**



Source: Morris, Kis and Dumitru, 2007

tually disappear. The ASTEC model was used to test the consequences of different combinations of tariffs on revenues, customer burden, consumption and production. The modelling results were then provided to decision makers to enable them to choose an equitable tariff schedule that can be expected to generate sufficient revenues.

Figure 8 depicts one such set of modelled tariffs for three milestone years. In this scenario, household tariffs undergo a substantial increase from about HRK 8/m^3 for water and wastewater together, up to almost HRK 17/m^3, while combined industrial tariffs increase by less than 15 percent, mainly attributable to a change in the price of wastewater services.

One of the impacts of higher prices is lower consumption, as seen in Figure 9. Since household prices under the investigated scenarios increased more than industrial prices, the corresponding change in consumption was also larger for households.

During the tariff modelling exercise, particular attention was paid to external factors that may impact the level of cost-recovering tariffs. One such factor, which is often overlooked, is the HRK equivalent of the annual amortisation of the EBRD loan. Since the EBRD loan is set in EUR, the HRK denominated payment is subject to changes in the EUR/HRK exchange rate. The interest itself may also change, reflecting changes in inter-bank overnight rates. While these factors are rarely given

TABLE 24: **Schedule of household tariffs**

VARIABLE TARIFFS AND RELATED FEES (HRK/m³)

Date of tariff change	Water tariff	VAT on water tariff	Wastewater tariff	VAT on wastewater tariff	Network maintenance fee	Water-use fee paid to Croatian Waters	Wastewater protection fee paid to Croatian Waters	Total variable water and wastewater tariff
1998.08.01	1.45	0.32	0.68	0.15	-	0.80	0.90	4.30
1999.05.01	1.83	0.40	0.86	0.19	-	0.80	0.90	4.98
2000.02.01	2.00	0.44	0.95	0.21	-	0.80	0.90	5.30
2004.06.01	2.41	0.53	1.14	0.25	-	0.80	0.90	6.03
2006.03.01	2.75	0.61	2.25	0.50	-	0.80	0.90	7.80
2008.04.01	2.88	0.63	2.36	0.52	-	0.80	0.90	8.09
2008.06.01	2.88	0.63	2.36	0.52	0.97	0.80	0.90	9.06

Fixed network maintenance fee (HRK/month/connection) 14.19 + 3.13 VAT

TABLE 25: **Schedule of industrial tariffs**

VARIABLE TARIFFS AND RELATED FEES (HRK/m³)

Date of tariff change	Water tariff	VAT on water tariff	Wastewater tariff	VAT on wastewater tariff	Network maintenance fee	Water-use fee paid to Croatian Waters	Wastewater protection fee paid to Croatian Waters	Total variable water and wastewater tariff
1998.08.01	4.3	0.95	1.15	0.25	-	0.8	0.9	8.35
1999.05.01	5.41	1.19	1.45	0.32	-	0.8	0.9	10.07
2000.02.01	6.5	1.43	1.75	0.39	-	0.8	0.9	11.77
2004.06.01	7.83	1.72	2.11	0.46	-	0.8	0.9	13.83
2006.03.01	8.63	1.90	4.15	0.91	-	0.8	0.9	17.29
2008.04.01	8.63	1.90	4.15	0.91	-	0.8	0.9	17.29
2008.06.01	8.63	1.90	4.15	0.91	0.97	0.8	0.9	18.26

Fixed network maintenance fee (HRK/month/connection) 14.19 + 3.13 VAT*

* This level of fee applies to water meters with a diameter between 13 mm and 20 mm. Larger-diameter meters are subject to higher fees. For instance, HRK 44.85/month for 150 mm meters

much weight, the recent volatility of the international financial markets points to the presence of some apparent risks.

As an additional twist, the impact of the introduction of two-part tariffs has also been analysed. The existence of a fixed tariff component makes it possible to cut back on the otherwise necessary increase in the variable component of the tariff.

Partly based on these modelling results, ViK Karlovac eventually introduced a fixed tariff on April 1, 2008, the first time this had been done by a Croatian water utility. The declared purpose of the fixed tariff is to generate revenues for the continuous maintenance of the water network. Its level is the same for all households, but it depends on the size of the water meter in the case of industrial customers. Additionally, on June 1, 2008, an investment fee was introduced, which is transferred from ViK Karlovac to a special account held by the city of Karlovac. Funds accumulated on this account will be used to finance future water and wastewater investments.

Tables 24 and 25 show the changes in tariffs since August 1998 for households and industrial customers respectively.

The changes in variable tariffs are depicted in Figure 10. The 2008 adjustments of the rate of the variable tariffs, and the introduction of the fixed tariff and investment fee, not only generate higher revenues but have also started to decrease the percentage gap between the average industrial and household tariff.

It should be noted that recently a public service agreement was signed between ViK Karlovac and the city of Karlovac. This agreement, among other things, determines the method and conditions of tariff calculation for water and wastewater services, therefore little room is left for arbitrary changes of tariffs based on political or other preferences.

As a way to increase revenues, the improved future collection of invoices is also targeted, although room for improvement is limited as ViK Karlovac was already able to achieve a collection ratio of around 95 percent in 2006, as opposed to less than 90 percent 10 years ago. Improvements in collection can mainly be explained by the disconnection of non-paying customers, as well as legal procedures.

Case study 2
The reform process at the Korca water supply and sewerage company

Water and wastewater utilities in Albania face immense challenges. A long period of neglect, insufficient financing and the slow speed at which old practices change have left the sector in a dire situation. The use of tap water for drinking is often associated with outbreaks of disease, the average service time is less than 10 hours per day, and the proportion of non-revenue water is above 60 percent. Regarding the financial condition of the utilities, tariff revenues in general do not cover operating costs and sizeable state subsidies are needed merely to keep the utilities running, let alone make new investments. While the Government of Albania is keen to introduce major changes in the way the sector operates, considerable improvement also requires dedication and effort on the part of utility managers and

FIGURE 10: **Variable household and industrial tariffs,**

Water and wastewater together, including all fees and taxes (HRK/m^3)

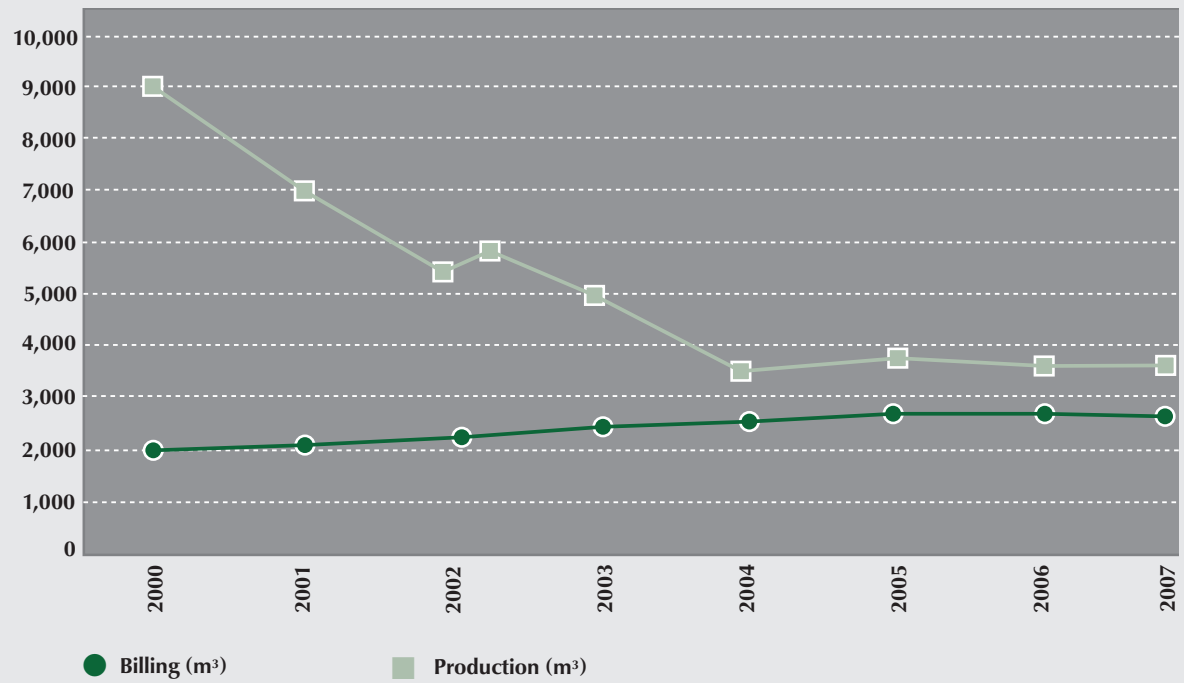
staff, as well as municipal decision makers. Fortunately, this is possible, as proved by the case of the Korca utility.

Over the last 10 years, the daily water supply has improved from between four and six hours to 24 hours. Water has become safe to drink, and water loss has decreased from 78 percent to 20 percent. In absolute terms, the quantity of billed water has changed only slightly, while improvements in the network and administrative practices have made it possible to reduce water production from 9 million m^3 in 2000 to about 3.5 million m^3 in 2007, as depicted in Figure 11. The company is now on a stable financial footing, covering not only its operating costs in the narrowest sense, but also being in a position to repay a loan.

How was it possible to attain such an astounding change? The answer seems to be foreign assistance coupled with local perseverance.

In 1997, Korca received financing from the German development bank KfW, in the form of a combination of a soft loan of EUR 10 million with a repayment period of 40 years and a preferential interest rate of 0.75 percent; and a grant of EUR 14 million. The EUR 24 million were invested in several activities:

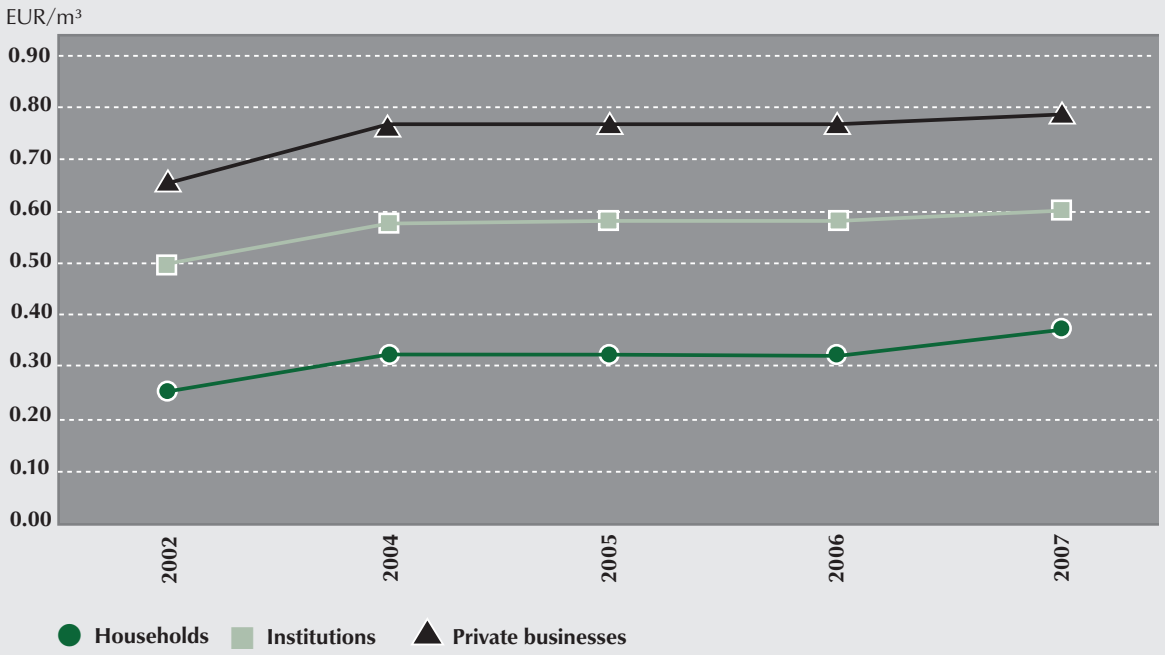
FIGURE 11: **Billed and produced water in Korca**



- Four new deep wells were drilled to secure a safe supply of drinking water.
- A water main was established between the new wells and the collection tanks.
- A new pumping station was constructed, including an emergency generator, which is necessary because of the unpredictability of electricity supply in Albania.
- The water network was upgraded, including two new water mains, two new reservoirs and the rehabilitation of the existing reservoir.
- The network pipelines were rehabilitated.
- Leak detection equipment was purchased and put into operation.
- Investments were made in the administrative building, including the workshop, material storage building, vehicle shelter and guardhouse.
- A new, computerised billing system was introduced.

The KfW project not only provided funding but also offered a wide range of technical and institutional assistance throughout the implementation period. The institutional assistance was concentrated on public relations, the use of the new billing system, modern accounting practices, internal reorganisation and an emp-

FIGURE 12: **Water tariffs per customer at the Korca water utility, 2002 to 2007**



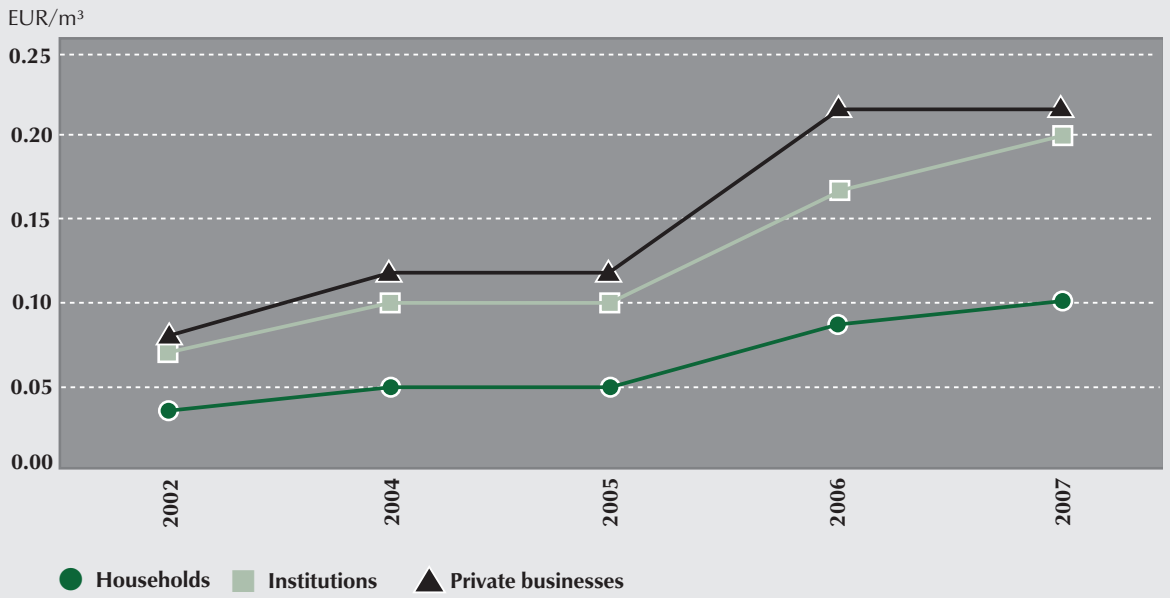
Source: Korca water utility

loyee performance evaluation programme. All this was only possible because of the forward-looking management, which was ready to make short-term sacrifice in order to ensure a brighter future.

The billing system, launched in 1999, made it possible to create a full-scale customer database, storing current and historical data on invoices, collection and unpaid bills, broken down for water and wastewater services. The system makes it possible to screen for problematic clients and to quickly generate various statistics on consumption, billing and payments. Overall, it contributed to the increased collection of bills. The financial accounting system also changed. Accountants were trained to keep the records using computer software rather than traditional accounting books, and to generate data for, and participate in, the calculation of tariffs.

The number of employees was reduced from 132 in 1998 to 88 in 2007. However, the workforce in 2007 was better trained and an employee recognition programme was established to ensure that good work is rewarded. At the same time, some of the activities were outsourced in order to reduce costs. These included the guarding of facilities such as the pumping station, the wells, the reservoirs and the administrative offices; certain tasks related to the maintenance of the water and

FIGURE 13: **Sewerage tariffs per customer at the Korca water utility, 2002 to 2007**



Source: Korca water utility

sewerage system and the establishment of new connections; and the supply of fuels and chemicals (chlorine).

The installation of water meters started in July 2001, while a two-year programme to replace old meters is due to commence. This programme will be financed from the company's own resources.

Over the last 10 years, tariffs have been raised in order not only to recover operating costs but also to ensure that loans taken out for past investments can be repaid and savings for future investments can begin to be accumulated.

A maintenance programme has been planned for the water network in order to minimise accidental interruptions. There will also be a periodic leak detection programme to keep water losses under control. The focus of investments will be on the wastewater infrastructure, including a wastewater treatment plant as well as the rehabilitation of the existing sewer. The latter will also help to protect the water base of Korca. In contrast with water service investments in the past, the plan is to finance the majority of future investments via loans, with only about 20 percent grant financing.

Case study 3
Introduction of two-part tariffs at the Transdanubian Waterworks

One of the large regional water utilities in Hungary, the Transdanubian Waterworks (Dunantuli Regionalis Vizmuvek, DRV) introduced a two-part tariff scheme on January 1, 2005. The price regulator for DRV, as for the other four regional utilities in Hungary, is the Ministry of Environment and Water, and approval for the proposed tariff design required a long prior negotiation and conciliation process between the regulator and the regional utilities.

There were many considerations motiviating DRV to switch to two-part tariffs. The service area of the utility includes the most popular summer resort in Hungary, the Lake Balaton area. Due to the large number of summer cottages and the large tourist infrastructure, the majority of water use and related wastewater discharge is seasonal and approximately doubles during the summer months. In the case of a simple variable tariff, company revenues would follow a similar intra-year pattern. However, expenditures are more evenly distributed through the year. While the use of electricity and chemicals are, to some extent, proportionate to water use, the majority of costs — including depreciation, maintenance, repair, labour costs and quality assurance — are continuous. The fixed component of a two-part tariff helps to smooth revenues so that they are generated in a way that more closely corresponds to the pattern of expenditures.

The composition of connections within the service area of DRV in 2005, at the time the two-part tariff scheme was introduced, is shown in Table 26. The number of seasonal connections was in fact higher than the number of permanent connections.

Another consideration for DRV was equity. Since the majority of the costs incurred in assuring service are independent of the number of cubic metres consumed, it would be fair if this were reflected in the fixed component of the tariff, so that larger and permanent consumers do not have to bear a disproportionately high share of all costs through only the variable tariffs.

Lastly, overall consumption in the service area of DRV has decreased by more than 30 percent since the beginning of the 1990s. This is partly a reflection of economic restructuring, and partly a reaction to the increasing of tariffs to recover inflated costs. The gradual decline in consumption over the years has eroded the revenue base of the utility, and having only a variable tariff would require continued substantial increases in the price per cubic metre. The fixed tariff can provide the counterbalance here.

Once the proposed two-part tariff design had been accepted by the regulator, it was introduced by the regional utilities on January 1, 2005. The value of the flat monthly fee depends on the diameter of the water meter, assuming that large-diameter meters correspond to larger capacity requirements, which, in turn, require higher fixed costs. Table 27 shows the fixed tariffs in force in 2008.

On top of the fixed tariffs, customers pay a variable water tariff of HUF 337/m^3

TABLE 26: **Number of DRV water connections in 2005**

	PERMANENT CONSUMERS	SEASONAL CONSUMERS
Households	77,350	84,587
Commercial	8,859	3,392
Total	**86,209**	**87,979**

TABLE 27: **Fixed tariffs for DRV in 2008 (HUF/month, without VAT)**

DIAMETER OF THE WATER METER (mm)	WATER	SEWAGE
13-20	181	322
25-32	916	1,620
40-50	2,780	4,840
65-100	9,530	16,390
150-200	28,950	47,910

Note: EUR 1 was equivalent to about HUF 260 in November 2008

on average, and a wastewater tariff of HUF 480/m^3. Altogether, fixed tariffs make up approximately 9 percent of all tariff revenues.

The introduction of the new tariff design was communicated to customers via several channels, one of which was the company's quarterly newsletter, which is published in printed form and on the company's website. Each year the newsletter contains an article dedicated to tariffs. In the issue published in late 2004/early 2005, the article on tariffs described the new design and tariff levels, the rationale behind modifying the tariffs, and the changes in costs and state subsidies. Practical examples of the application of the new tariffs were also included, such as the methods used to calculate the fixed tariff in the case of multi-apartment buildings. The DRV newsletter is usually between 20 and 30 pages long: among many other topics it also reviews the company's strategic and annual plans, on-going investments, methods of invoice payment, the operation of the departments, and reforms of some of the internal operations, all in the form of easy-to-read interviews and articles.

Annexes

Annex 1
Water supply and sewerage programme, the former Yugoslav Republic of Macedonia

In the former Yugoslav Republic of Macedonia, the German bank KfW introduces a benchmarking approach before funding water supply projects in utilities. The KfW programme also introduces a quality management approach through an institutional strengthening consultant who assists municipalities in meeting the benchmarks. The programme covers the municipalities of Gostivar, Tetovo, Kavadarci, Negotino, Bitola, Kocani, Gevgelija and Radovis. In addition, technical assistance for project preparation is given through a KfW grant.

Boxes 25 and 26 show the targets to be achieved by the communal enterprise and muncipality respectively prior to phase 1 — that is, three months prior to programme participation.

BOX 25: Targets to be achieved prior to phase 1: Communal enterprise

100% of all registered customers receive water bills
Monthly cash (excluding compensation) generated from water sales is >60% of the invoiced amount within the same month
Water tariffs enable the municipal enterprise to cover at least: • Operating costs (staff, energy, chemicals, administration) • Maintenance/reinvestment costs: EUR 5/connection/year • Current debt service, if applicable, and forecast debt service for phase I • Any other expenditures to be covered by the cash generated from water sales, e.g. cleaning of streets and parks
Monthly cash generated from other activities covers expenditure on these other activities
The municipal enterprise proves that it is willing to: • Introduce separate accounts according to different activities within the municipal enterprise and to strive for autonomous departments whose costs are covered by their revenues • Reduce water consumption and losses prior to increasing water production • Oversee/implement force account works • Coordinate investment measures if financed from other sources

BOX 26: Targets to be achieved prior to phase 1: Municipality

The municipality pays for the water supply and sewerage services of the municipal enterprise
The municipality proves that: • It grants the municipal enterprise the right to:
- disconnect defaulting customers;
- access water meters.
• Coordinate investment measures if financed from other sources

Annex 2
Checklist: Allocating risks and responsibilities

☐ Define the major areas of responsibility (management, operations and maintenance, new investment)

☐ Define specific responsibilities for each area

☐ Identify the risks that are associated with each responsibility

☐ Note the direct and indirect relationships between risks and responsibilities

☐ Establish how the risks are interrelated

☐ For each risk, identify which party (the operator, contracting authority, or customers) is best able to bear the risk, and in particular who can:

- ☐ Predict the risk
- ☐ Influence the risk
- ☐ Control the impact of the risk
- ☐ Diversify or absorb residual risk

☐ Decide whether the risk should be fully allocated to one party or shared

☐ Check for any constraints on the ability of the parties to bear risk (such as information problems or unwillingness of the contracting authority or operator to bear risks they appear best able to manage)

☐ Based on the risk analysis, assign a party to:

- ☐ Assume each responsibility
- ☐ Bear each risk

Source: The World Bank, *Approaches to Private Participation in Water Services. A Toolkit*, 2006.

Annex 3
Water supply and wastewater treatment in the Czech Republic — an example of lease arrangement

In the Czech Republic, all water systems have had a certain level of private sector participation since the privatisation process in the early 1990s. In most cases, one specific operator has operated the water systems since then, with some exceptions where operators have changed hands. All contracts are lease/operation contracts where the operator pays a lease for the municipality-owned water system in return for an exclusive right to operate and to collect tariffs from the customers.

The biggest weakness of these lease contracts is that they lack performance criteria for the operators and, as a consequence, the provisions on performance monitoring and related possible sanctions are comparatively weak. This is because the contracts are based on an assumption that Czech water legislation would compensate for these contractual deficiencies. However, an enquiry into the supervisory activities of regional water authorities confirms that this is not the case.

This indicates that the water sector in the Czech Republic has apparently not been made aware that performance is an issue to be regulated in these types of contracts and that mere references to existing legislation are not sufficient. In certain cases there also seems to be a tendency towards recreating, in a privatised setting, the former structure in which one entity was both owner and operator. In these cases, the conflict of interest that normally drives contractual relationships is not present.

Financial indicators show that the liquidity of the operators is very high and profitability is good. The operator's financial position, in the absence of any significant investments and assets of its own, is largely determined by the costs of operating the system (of which the lease rent is the most significant and fixed) and a combination of demand and tariffs.

In the case of Pilzen, the lease rent is currently calculated on the basis of the leased assets value (asset charge) and the financing (principal and costs) of the asset acquisition and expansion programme. The city has drafted a long-term programme for expanding the system, including and going beyond the wastewater treatment plant project. This continuous increase in high-value assets will lead to a constant increase of the lease.

Liberec has a "negotiated" rent and Karlovy Vary has a rent based on the recovery of the operating and capital costs of the asset owner. In both of these cases the maximum tariff is insufficient to provide the funding required to implement EU directives by 2010.

The "cost plus" formula for calculating tariffs is prescribed by the relevant laws and regulations issued by the Czech Government. By arriving at a final tariff level through adding profit as a percentage of lease rent and operator's costs, it removes any incentive for effective cost controls in both investments and operations.

Notes

1 UNDP/GEF, Hungarian Environmental Economics Centre, Hydro-engineering Institute, Sarajevo, Danube Regional Project. Assessment and development of municipal water and wastewater tariffs and effluent charges in the Danube River basin, Volume 2: "Country-Specific Issues and Proposed Tariff and Charge Reforms: Bosnia i Herzegovina – National Profile". 2004.

2 *Approaches to Private Participation in Water Services*, The World Bank, Private-Public Infrastructure Advisory Facility, 2006

3 http://ec.europa.eu/environment/enlarg/dablas/downloads/psa_water_en.pdf

4 http://ec.europa.eu/regional_policy/sources/docgener/guides/ppp_en.pdf

5 http://www.ppiaf.org/documents/toolkits/LaborToolkit/Toolkit/pdf/reference/Caberno_Verzosa_Mit_854BA.pdf

6 http://www.ppiaf.org/documents/toolkits/LaborToolkit/toolkit.html

7 There are often other purposes, such as improved/sustained service quality, compliance with regulations, or protection of the water base. Obviously, these need to be considered during the decision-making process. Our assumption about savings being the only goal of the investment is hypothetical in order to better illustrate the importance of measuring costs and benefits.

8 Net benefit is the difference between the benefit and the cost.

9 The number of suppliers depends on the degree to which the power market of a country is liberalised. In Hungary, which has a partially liberalised market, there are a number of privately owned "energy traders", which buy power directly from the power plants or abroad, and sell it directly to large consumers.

10 This, in fact, depends on the existing conditions in the electricity market — in some periods, Nyirsegviz opts for scheduled purchases, while at other times it buys at the regular tariff without the scheduled part.

11 The regulatory authority responsible for the water sector in Kosovo (as defined under UNSCR 1244) (WWRO) collects performance data from the water companies, computes indicators using these data, and sets "achievable, but nonetheless challenging" targets, the fulfilment of which is annually monitored. (WWRO, 2007)

12 I.e., serving high-cost areas at a higher tariff would place too great a burden on the population living there.

13 DABLAS — Danube and Black Sea

14 The larger the bill, the smaller the proportion of the fixed component. For households with particularly low consumption, however, the fixed tariff can make up the larger part of the bill.

15 The water regulator of Kosovo (as defined under UNSCR 1244) allows a fixed monthly tariff, but its level is not allowed to exceed the direct costs of customer service activities, such as reading meters and replacing meters.

16 The water regulator in Kosovo (as defined under UNSCR 1244) in fact declares that they do not support increasing block tariffs, mainly because of the impracticality of applying such a scheme to apartment blocks with only one central meter (WWRO, 2007b).

17 Many customers actually show a willingness to pay to avoid the deterioration of service levels or water quality, as observed by a 2002 study by Danish Environmental Assistance for Eastern Europe (DANCEE).

18 At the same time, ViK Karlovac, like other water utilities in Croatia, pays substantial water and wastewater fees to the Government of Croatia. On balance it pays more in fees than the grants it receives from the state.

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